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**China's Domestic Business Environment and its Impact on
Trade in Services: An Empirical Analysis**

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Doctor of Philosophy

at
Lincoln University
by
Xuedong Li

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Abstract of a thesis submitted in partial fulfilment of the
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Abstract

China's Domestic Business Environment and its Impact on Trade in Services: An Empirical Analysis

by

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China's trade in services has increased rapidly since 2005 (Wu, 2015). The expanded trade in services has contributed to the performance of China's overall trade, and enhanced China's status in the international trade arena (Tang, Zhang, & Findlay, 2013). The importance of the trade in services in China's economic development has been recognized and emphasised in China's Twelfth Five-Year Plan (2011-2015) (Chen & Whalley, 2014). The Chinese government aims to continue to increase the share of its services sector to GDP to 55 percent in 2020 (Gardels, 2016). China's integration into the world services market will not only impact on China's own economic development, but also have influence on the global economy.

Although China's trade in services has expanded substantially, China's services sector and trade in services has received less attention when compared to the expansion of China's manufacturing sector and its merchandise trade (Wu, 2015). A review of literature shows that the published empirical studies on China's trade in services are sparse. To date, there is no published empirical research on analysing the relationship between the indicators of the domestic business environment and China's trade in services, specifically, China's services exports and imports.

This current research identifies a set of testable national level indicators of the domestic business environment in a Chinese context, and empirically investigates the effects of these indicators of the domestic business environment on China's trade in service. The identified five testable indicators are foreign direct investment (FDI), tertiary education, the employment in the services sector, inflation,

and the Internet diffusion. This research employs structural equation modelling to examine the relationships between the selected five indicators of the domestic business environment on China's trade in services (especially, on China's service exports and service imports). The empirical results of this research reveal that FDI is the most significant indicator that impacts on the development of both China's services exports and services imports. In addition, Internet diffusion has the least impact on China's service exports, while, employment in the service sector has the least impact on China's services imports.

The current research makes both a theoretical and practical contribution to future research. This research contributes to the economic literature on the trade in services as it is the first empirical research that identifies and examines the national level indicators of the Chinese domestic environment on its trade in services. The multiple regression modelling and the identified set of testable national level of indicators of the domestic business environment can be applied to the future research for different countries and regions. Further, the empirical findings in this research provide an improved understanding of the important linkage between China's domestic business environment and its trade in services.

Keywords: China; Domestic business environment; Services; Trade in services

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Table of Contents

Abstract	ii
Table of Contents	v
List of Tables	viii
List of Figures	ix
 Chapter 1 Introduction	 1
1.1 Chapter Introduction	1
1.2 Research Background.....	1
1.2.1 The Services Sector and Trade in Services	1
1.2.2 The Business Environment	4
1.2.3 China's Trade in Services.....	4
1.2.4 China's Business Environment	6
1.3 Research Problem Statement	7
1.4 Research Gaps.....	10
1.5 Research Objectives.....	11
1.6 Research Contribution	11
1.7 Research Overview	12
 Chapter 2 Literature Review.....	 14
2.1 Chapter Introduction	14
2.2 Overall Reviews of Trade in Services	14
2.2.1 The Definitions and Classification of Trade in Services.....	14
2.3 A Review of Business Environment.....	20
2.4 A Review of China's Trade in Services.....	21
2.5 A Review of China's Domestic Business Environment	25
2.6 Overview of Research Models	28
2.6.1 Representative Research Models Used Regarding to Trade in Services.....	28
2.6.2 Research Models Used Regarding to China's Trade in Services	29
2.6.3 Research Models on Measuring Business Environment and Trade.....	30
2.7 Indicators of Domestic Business Environment (DBE)	34
2.7.1 Indicators of DBE in Previous Studies	34
2.7.2 The Constructed Indicators of DBE Used in the Current Research	37
2.8 Trade Control Variables	49
2.8.1 Real Exchange Rate	49
2.8.2 World Income and Domestic Income	53
2.9 Chapter Summary	57
 Chapter 3 Research Method.....	 59
3.1 Chapter Introduction	59
3.2 Data Construction	59
3.2.1 Data Collection Background	59
3.2.2 Building New Indicators of DBE in China.....	62
3.3 Research Questions	62
3.3.1 Research Question 1 Relating to Research Objective 1.....	62

3.3.2	Research Question 2 Relating to Research Objective 2	62
3.3.3	Research Question 3 Relating to Research Objective 3	63
3.4	Conceptual Research Model Development	63
3.4.1	Theoretical Justification of the Indicators of DBE	66
3.4.2	Theoretical Justification of the Trade Control Variables.....	68
3.4.3	Econometric Modelling.....	69
3.4.4	Assumptions for Regression Analysis.....	73
3.5	Chapter Summary	79
Chapter 4 Data Analysis and Empirical Results.....		80
4.1	Chapter Introduction	80
4.2	Assumptions for Regression Analysis.....	80
4.2.1	Unit Root Test	80
4.2.2	Outliers.....	80
4.2.3	Multicollinearity.....	81
4.2.4	Linearity.....	81
4.2.5	Error Term Normality	81
4.2.6	Error Term Independence.....	82
4.2.7	Error Term Homoscedasticity	82
4.2.8	Ramsey RESET Test.....	83
4.3	Results Pertaining to the Research Objectives	83
4.3.1	Results Pertaining to Research Objective 1 and Research Objective 3	83
4.3.2	Results Pertaining to Research Objective 2 and Research Objective 3	85
Chapter 5 Discussion and Conclusion.....		87
5.1	Chapter Introduction	87
5.2	Summary of the Major Contributions of This Research	87
5.2.1	Summary of Key Facts in This Research	87
5.2.2	Summary of the Research Gaps, Objectives and Questions	88
5.2.3	Summary of Key Theoretical and Practical Contributions	90
5.3	The Relations between the Dependent Variables and Independent Variables.....	92
5.3.1	Conclusions Pertaining to Research Objective One.....	92
5.3.2	Conclusions Pertaining to Research Objective Two.....	92
5.3.3	Conclusions Pertaining to Research Objective Three	95
5.3.4	The Effects of Standard Control Variables on Services Exports and Imports	96
5.4	Contributions of This Research	98
5.4.1	Theoretical Contributions	98
5.4.2	Practical Contributions.....	100
5.5	Limitations of The Research.....	110
5.6	Avenues for Future Research.....	111
Appendix A Regression Results		112
A.1	Regression Results Relating to Services Exports.....	112
A.2	Regression Results Relating to Services Imports	112
Appendix B Assumptions for Regression Analysis		113
B.1	Unit Root Test	113
B.2	Outliers.....	124
B.3	Multicollinearity.....	128

B.4	Linearity	129
B.5	Error Term Normality.....	130
B.6	Error Term Homoscedasticity	131
B.7	Ramesy RESET Test	133
References		134

List of Tables

Table 2-1 Definitions of services	15
Table 2-2 The main differences between physical goods and services	16
Table 2-3 The gravity model and trade in services	31
Table 2-4 Structural equation model and trade in services	32
Table 2-5 The domestic business environment and trade	33
Table 2-6 The number of sectoral employees of different education levels in China in 2010	44
Table 2-7 The number of sectoral employees of different education levels in China in 2000	44
Table 3-1 The list of the searched databases	61
Table 3-2 Critical values for the cointegration test	70
Table 4-1 Durbin-Watson test statistics	82
Table 4-2 The Brusch-Pagan LM test results for Regression Equation (7)	83
Table 4-3 The Brusch-Pagan LM test results for Regression Equation (8)	83
Table 4-4 Regression results relating to Equation (7)	84
Table 4-5 Regression results relating to Equation (8)	85
Table 5-1 The most to the least significant influential effects of the five indicators on services imports.....	96

List of Figures

Figure 1-1 Value-added in the three sectors to the world's GDP (in Percentage) (World Bank, 2016b)	2
Figure 1-2 The volume of exports and imports in services from 1980 to 2014 (World Bank, 2016b)2	
Figure 1-3 The growth of service exports and imports in China (US\$ in Billions) (United Nations Conference on Trade and Development, 2016)	5
Figure 2-1 China's exports of services by services industry in 2014 (NBSC, 2015)	22
Figure 2-2 China's imports of services by services industry in 2014 (NBSC, 2015).....	22
Figure 2-3 The percentage of trade in services in GDP: China, low income, middle income and high income countries (World Bank, 2016a)	24
Figure 2-4 The volume of merchandise and service trade in China (US\$) (World Bank, 2016b)	25
Figure 2-5 China's ranking on <i>Doing Business</i> topics in 2015 (Scale: Rank 189 centre, Rank 1 outer edge) (World Bank, 2016a)	27
Figure 2-6 FDI inflows into China between 1990 and 2014 (World Bank, 2015)	38
Figure 2-7 The Number of Employed People in China's Agricultural, Manufacturing and Services Sectors (in millions) (National Bureau of Statistics of China, 2015)	41
Figure 2-8 Growth in GDP, GDP Per Capita (annual %) and Inflation (%) in China (World Bank, 2016b)	46
Figure 2-9 The number of Internet Users (in ten thousand) and Internet Penetration Rate (in percentage) in China between 2005 and 2014 (China Internet Network Information Center, 2015)	49
Figure 2-10 China's nominal exchange rate and trade deficit in services between 1980 and 2014 (National Bureau of Statistics of China, 2015).....	52
Figure 2-11 China's real effective exchange rate index (REER) (2010=100) and trade deficit in services between 1983 and 2014 (National Bureau of Statistics of China, 2015).....	53
Figure 2-12 World's GDP growth rate and China's service exports between 1980 and 2014 (annual percentage changes) (World Bank, 2016b)	57
Figure 2-13 China's GDP growth rate (annually percentage change) and the volume of services imports (US Million) between 1985 and 2014 (World Bank, 2016b)	57
Figure 3-1 How Doing Business Collects and Verifies the Data (World Bank, 2015a)	60

Chapter 1

Introduction

1.1 Chapter Introduction

This chapter begins by providing an overview of key information on the world's trade in services and the global business environment, and China's trade in services and its business environment. This discussion is followed by identifying three important research gaps, stating the objectives of this research to close the research gaps, stating the theoretical contributions that this research makes to the economic literature on China's trade in services and the domestic business environment, and finally, the practical implications generated by this current research are discussed.

1.2 Research Background

1.2.1 The Services Sector and Trade in Services

The global services sector and the trade in services have expanded substantially in real terms (Park & Park, 2011). The World Bank (2016b) reported that the value added of the world's services sector as a percentage of the world's GDP has increased from 64.3 percent to 68.5 percent between 2000 and 2014, which was a much higher percentage than the value-added of the manufacturing and agricultural sectors during the same time period (See Figure 1.1). In addition, the global trade in services has increased significantly and become the fastest growing component of international trade in recent years (Breinlich & Criscuolo, 2011). The United Nations Conference on Trade and Development (UNCTAD) statistics (2016) showed that the total global trade in services has increased from US\$360 billion in 1980 to US\$ 10.18 trillion in 2014. Specifically, the volume of services exports and services imports reached US\$5.14 trillion and US\$5.04 trillion in 2014, respectively (See Figure1.2) (United Nations Conference on Trade and Development, 2016). The Global financial crisis affected the trade in general. In particular, the volume of trade in services decreased in 2009. The world trade in services has increased again since 2010 (United Nations Conference on Trade and Development, 2016).

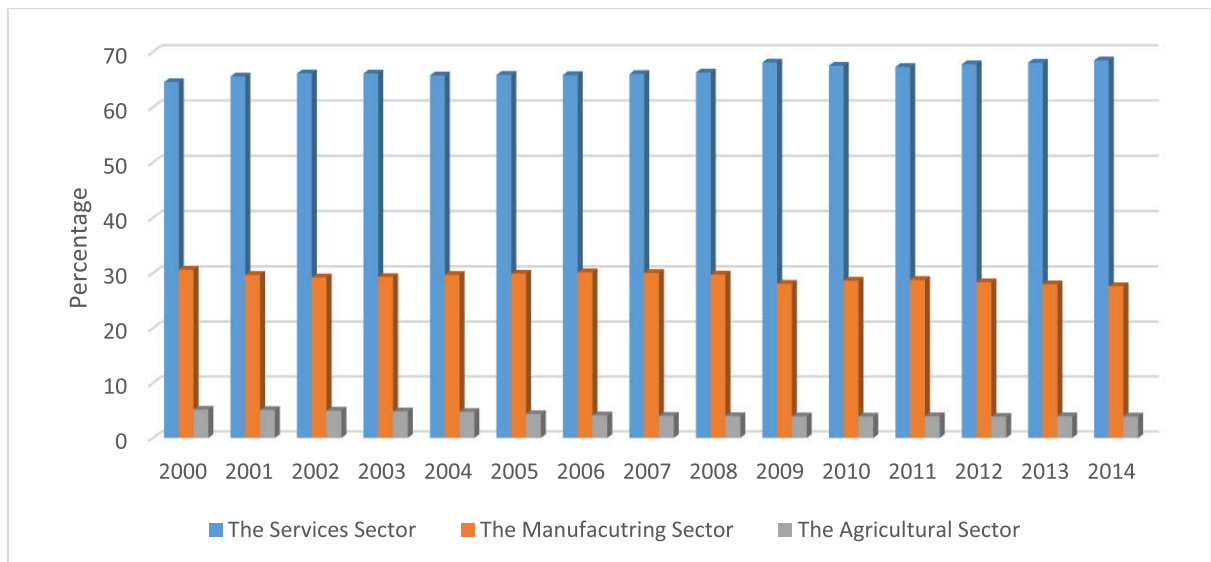


Figure 1-1 Value-added in the three sectors to the world's GDP (in Percentage) (World Bank, 2016b)

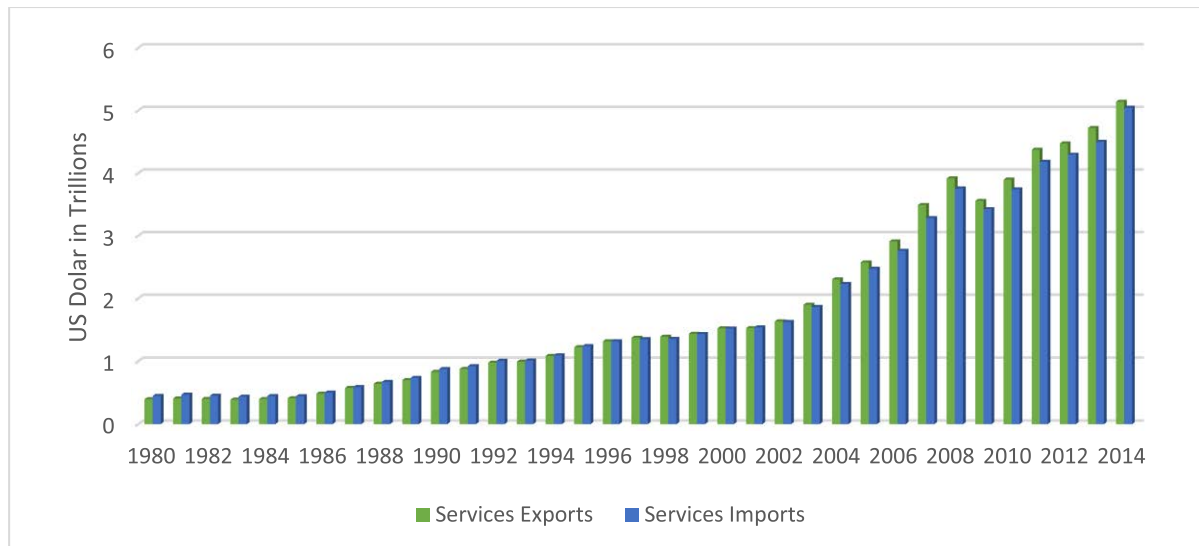


Figure 1-2 The volume of exports and imports in services from 1980 to 2014 (World Bank, 2016b)

The services sector has had a growing influence on the world's economic development, business performance and the level of investment during the past three decades (Nissan, Galindo, & Méndez, 2011). Ghani and O'Connell (2014) point out that the services sector contributes directly and significantly to gross domestic product growth (GDP) in many developing and developed countries, through job creation, providing labour and technology inputs, and strengthening public services. The International Labour Organization (ILO) (2015) notes that job creation in the services sector in the world economies is predicted to be very dynamic until the end of this decade, in particular, when

compared to job creation in the agriculture and manufacturing sectors. In addition, Próchniak (2011) indicates that those countries with a higher proportion of services in their economic activities tend to grow faster than the countries with a larger share of agricultural or manufacturing sectors in their economic activities. Fatima, Azeem, Abbas, and Adil (2014) also demonstrate that the contribution of the growth in the services sector to reducing poverty is higher than the contribution of the growth of the agricultural or manufacturing sectors.

The trade in services provides opportunities for many countries to enhance the productivity of their services sector, expand their outputs of services to other sectors, and strengthen their comparative advantage in the global market (van der Marel, 2012). In particular, Cali, Ellis, and te Velde (2008) have noted that imports of services bring new skills and technologies, increase investment capital, stimulate greater competition and international best practice. Several researchers point out that the expansion of the world trade in services is a result of the innovation of information and technology, increased employee mobility, and the deregulation and liberalization of capital flows (Gani & Clemes, 2013; Nissan et al., 2011; Park & Park, 2011). Dash and Parida (2012) suggest that facilitating the trade in services will eventually contribute the economic growth in the majority of countries.

Scholars have investigated the various perspectives of the trade in services, such as the relationships between the trade in services and economic growth (Dash & Parida, 2012), the bilateral trade in services between nations (Nath, Liu, & Tochkov, 2015), and the determinants that impact on the development of trade in services (Karam & Zaki, 2015). However, published empirical research on the trade in services in developing countries is limited in number, especially when compared to the published research on trade in services in developed countries. Engman, Saez, and Cattaneo (2010) point out that researchers have overlooked the potential of the trade in services in developing countries.

1.2.2 The Business Environment

The business environment refers to a wide range of factors that all have different influences (positive, negative or neutral) on the decisional and operational practices of many types of domestic and international businesses (Cherunilam, 2009; World Bank, 2018). Crozet, Milet and Mirza (2016) stress that an improved business environment assists the emergence of the services sector, and an increased engagement with the trade in services. For example, a highly protected and regulated business environment may result in service organisations that are facing multiple challenges to seek other countries to establish their businesses. Organisations normally select a country where the business environment is more liberalized and offers improved opportunities (Gani & Clemes, 2015). The policymakers in many countries have recognized the impact of the overall business environment on trade and they have introduced efficient policies and legislation to create a more favourable business environment to encourage organisations to establish and/or to expand their operations in those favourable environments (Gillanders & Whelan, 2014).

The significant effects of the overall business environment on economic growth and trade in selected countries have been highlighted in recent studies (Fatemeh, Mehdi, & Fereshte, 2016; Freund & Bolaky, 2008; Gani & Al-Abri, 2013). In particular, the domestic business environment is considered as one of the important factors that impact on the expansion of the trade in services (Gani & Clemes, 2013).

1.2.3 China's Trade in Services

Wu (2016) notes that China's services sector has contributed remarkably to its productivity and the growth of GDP in the last decades. The value added of services sector to China's GDP has increased from 22.3% in 1980 to 50.2% in 2015 (World Bank, 2016). China's total trade in services has increased rapidly since 2005 (Wu, 2015). The annual growth rate of China's trade in services has been higher than the annual growth rate of its GDP and the world's trade in services since 2000 (Chen & Whalley, 2014). The volume of China's services exports increased from US\$3.06 billion to US\$286.54 billion, and the volume of its services imports increased from US\$2.52 billion to US\$468.90 billion between 1985

and 2015 (see Figure 1.3) (United Nations Conference on Trade and Development, 2016). In 2015, China's services exports and imports had positive growth rates of 2.2 percent and 1.5 percent respectively, despite the world services exports and imports declining 6.1 percent and 6.2 percent (United Nations Conference on Trade and Development, 2016). In 2015, the WTO (2015) reported that China's service exports and imports were ranked fifth and third in global services trade, respectively. Although the volume of China's services exports and imports has been increasing, China's trade deficit in services widened from US\$5.5 billion in 2005 to US\$182.36 billion in 2015 (United Nations Conference on Trade and Development, 2016).

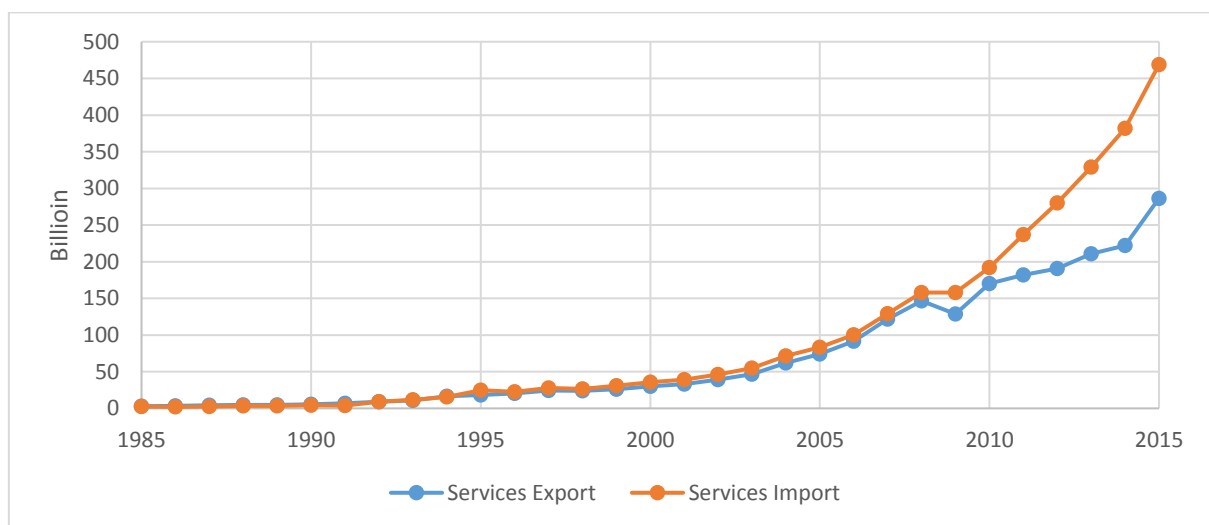


Figure 1-3 The growth of service exports and imports in China (US\$ in Billions) (United Nations Conference on Trade and Development, 2016)

The Chinese government has recognized the importance of the trade in services to its economic growth. After 15 years of negotiation, China joined the WTO in 2001, which is an important external factor that has accelerated the expansion of China's trade in services (Soo, 2012). China reported a substantial increase in its trade in services after China's accession to the WTO (Wang, 2015, p. 289). The Chinese government has also made commitments to progressively open its market access across the border and reform and liberalize its services sector under the GATS rules (Voon & Mitchell, 2010). In addition, the Chinese policymakers have also adopted sector-specific laws, regulations and departmental rules compatible with the GATS provisions to open its markets for foreign organisations

(He & Sappideen, 2009). Wu (2015) reports that China will continue to expand its services sector to achieve a greater trade in services in the international arena.

Further, China's Thirteenth Five-Year Plan (2016-2020) highlighted the potential contribution that China's services sector and the trade in services could make to China's sustainable economic development (Haacke, 2015). The services sector is predicted to be a major source of China's future output and to make a substantial contribution to its economy (Ding & Xu, 2015). The Chinese government aims to continue increase the share of its services sector to GDP to over 50 percent in the Thirteenth Five-Year Plan (Haacke, 2015). Reeves and He (2015) note that innovation and the impact of the technology are emphasised in the Five-Year Plan to promote the productivity and profitability of China's services industries, and facilitate the development of the trade in services.

1.2.4 China's Business Environment

China's economy and markets have changed dramatically during the last three decades (Hitt & Xu, 2015). With a population of more than 1.3 billion, China has become the second largest economy in the world after the United States in 2015 (Liu, 2016, World Bank, 2017). Although China's annual GDP growth rate slowed from 7.3 percent in 2014 to 6.9 percent in 2015, it was still significantly higher than the world average GDP growth rate of 2.5 percent (World Bank, 2016b). In addition, China's markets have been gradually opened and are attracting foreign companies and investors since China initiated a series of market reforms in 1978 (Wong, 2013). China was the world largest foreign direct investment (FDI) recipient in 2014 (World Bank, 2016b). FDI into China is the largest among the developing countries, and inward FDI in China accounted for US\$ 249.86 billion in 2015 (United Nations Conference on Trade and Development, 2016). In particular, the actual utilized foreign direct investment in China's services sector increased 10 percent from 2015 to 2016, and accounted for 70 percent of the national total from January to August in 2016 (Ministry of Commerce People's Republic of China, 2016).

The World Bank (2016b) reported that China's regulatory business environment in 2016 was ranked 84 out of 189 countries based on the collected multiple indicators of the business environment in the Doing Business project in 2016. The indicators used in the Doing Business survey showed that from 2003 to 2016 China reformed its policies and regulations to build a better regulatory business environment (World Bank, 2016b). For example, in 2016, China reduced the social security contribution rate charged to commercial organisations in order to lower the corporate tax rates. In 2015, establishing a business was made easier as the minimum capital requirement and the requirement to obtain a capital verification report from an auditing firm were eliminated (World Bank, 2016b).

Further, the deregulation of China's business environment has also been reflected in the societal changes that have occurred in its economy (Barton, Chen, & Jin, 2013). For example, the emergence of a sizeable middle class has spurred an increase in China's domestic consumption of a wide range of services (Yuan, Wan, & Khor, 2012). Moreover, employment has been shifting gradually from the manufacturing sector to the services sector. This shift has increased the demand for more skilled and higher educated employees to contribute to China's service industries (Holz, 2008; Li & Haynes, 2011). New technology and innovation have also provided opportunities for China's companies to expand their businesses and strengthen their competitiveness in the global market (Tang et al., 2013). Fortune (2016) reported that in 2016, China had more than 100 businesses that were included in the world's largest Fortune Global 500. The top ten organizations in China's 100 were service related businesses such as the Industrial & Commercial Bank of China and the China Construction Bank.

1.3 Research Problem Statement

Although China's trade in services has expanded substantially, China's services sector and trade in services received less attention when compared to the expansion of China's manufacturing sector and its merchandise trade (Wu, 2015). Chen and Whalley (2014) point out that China is still described as a country lacking a services culture. Wu (2012) also notes that the development of China's services began from a relative low base, and lags behind the level of world's average size services sector.

Sheng and Wang (2012) highlight four major issues in the expansion of China's trade in services in the new era. The authors note that one of the main issues is the structure of China's trade in services is irrational and unbalanced. Yang (2009) points out that traditional services industries, such as tourism and transport, have been the central components of China's service trade. However, the development of China's technology-intensive and knowledge-intensive services industries, such as insurance and communications, are lagging behind the world average (Harris, Robertson, & Xu, 2011; Soo, 2012).

China's overall trade in services is considered to lack a comparative advantage in the world trade in services (Barattieri, 2014; Sheng & Wang, 2012). China's services industries are still under restrictive protection, which affects services related enterprises from participating in international competition (Wang, 2015). Yang (2009) notes that the low degree of openness in the services sector results in a poor quality of service and a low level of market competitiveness. For example, despite the fact that the volume of China's trade in services has grown significantly, the development of China's merchandise trade has been far higher than its trade in services (Pan & Lv, 2013).

Sheng and Wang (2012) also report that the number of people with high educational level and the use of advanced technology in China's service sector is relatively low. The authors also report that China's advancements in technology has lagged behind that of many developed countries and this acts to weaken the competitiveness of China's service trade in the world market. Pan and Lv (2013) suggest that in order to strengthen China's competitive position in world services trade, China needs more advances in technology and value-added services and these can only be achieved by improving the level of technology and learning from the successful experiences of service providers in developed countries.

Further, China's service management systems and services trade legislation have been deemed to be imperfect and inadequate (Sheng & Wang, 2012). Pan and Lv (2013) note that China's service sector lacks unified coordination and management departments that are required to facilitate trade in services. Moreover, there is a large gap between China's trade in services legislation and the services trade requirements of the WTO and accepted international practice (Sheng & Wang, 2012).

Zheng, Zhang and Wang (2011) also point out that China's services have not been able to satisfy the increasing domestic customer demand. For example, China has a growing proportion of middle class people, who have placed higher demand on numerous service products (Yuan et al., 2012). However, while the World Bank (2014) reports that China's domestic demand and consumption has been slower than predicted since 2008, rising disposable incomes still require developing and improving services to suit the diversity of domestic customer demand. Subsequently China's government has been searching for new paths to boost the expansion of its service sector (World Bank, 2014).

In China's Twelfth Five-Year (2011-2015) plan, developing trade in services has become a core element in China's further economic development. China's government now aims to expand its trade in services for a greater integration and participation in the world's trading arena (Chen & Whalley, 2014). The government also intends to promote China's sustainable economic development (Wu, 2015). Gani and Clemes (2013) stress that the domestic business environment can help countries to expand their trade in services in the world's services sector. The domestic business environment can determine the number of constraints and additional costs borne by organizations in terms of their trade in services (Gani & Clemes, 2013). In particular, Gani and Clemes (2013) demonstrate that the indicators of domestic business environment effect the performance of a country's overall trade in services. The authors' findings were based on three income levels (low, middle, and high) in the selected countries.

Xu and Fan (2012) find that a better business environment had a strong positive impact on lifting China's domestic trade (including services) in eight regions (Northeast Region, North Municipalities, North Coastal Region, Central Coastal Region, South Coastal Region, Central Region, Northwest Region, and Southwest Region). However, to date, the specific relationships between China's trade in services and the key indicators of China's domestic business environment have not been identified nor empirically analysed in any published research. Therefore, examining the relative importance of China's trade in services and identifying the indicators of China's domestic business environment needs to be undertaken from both a practical perspective and in an academic research context (Soo, 2012).

1.4 Research Gaps

This current research has identified three research gaps after reviewing the literature on the indicators of domestic business environment from a global perspective, and specifically, on China's trade in services. The first research gap is that there is no concise and consistent set of national level indicators of the domestic business environment that can be empirically modelled in a Chinese context. There are numerous business indicators available in publications, such as the Doing Business, and the World Business Environment Survey, and some represent China's economy. However, there is a lack of synthesis among the various indicators identified in these studies and this restricts the ability to empirically test the effect of a set of existing indicators on China's trade in services.

The second research gap relates to a lack of published empirical research on investigating and examining the effects of the domestic business environment on trade in services in China. Gani and Clemes (2013) include China in the middle-income category of countries in their research on examining the relationships between the domestic business environment and trade in services in selected low, middle and high-income OECD countries. However, the results presented in their study are aggregated and are based on each the three income categories. Further, published empirical research on modelling and analysing the relationship between China's domestic business environment and its impact on trade in services at a macroeconomic level is absent from the literature. This research gap or the deficiency in services research is discussed from a country-specific perspective where country provides and opportune country case to proceed with this line of inquire. A large country study such as that of China would lead to identification of services sector policies with greater strength and meaning that could also have implications for countries in similar levels of economic progress elsewhere.

The third research gap relates to the lack of published empirical research focusing on identifying the most to the least important indicators of China's domestic business environment relative to the development of service exports and imports.

1.5 Research Objectives

The main purpose of this research is to investigate the linkage between the domestic business environment and the trade in services in China. In addition, the research will provide a comparative analysis of the effect of the indicators of the domestic business environment on the China's trade in services. In order to satisfy this objective, an empirical structural framework is adopted in this study. The structural research models developed in Santos-Paulino and Thirlwall's (2004) and in Gani and Clemes' (2013) studies are used as the modelling framework in this current research. A set of selected five indicators of the domestic business environment in a Chinese context have been developed for this current study based on a review of the published literature on the world economies: tertiary education, employment in the services sector, foreign development investment (FDI), inflation and internet diffusion. The five indicators are examined in terms of their ability to affect China's trade in services.

The three main research objectives are:

Research Objective 1 is to identify a set of testable national level indicators of the domestic business environment in a Chinese context.

Research Objective 2 is to examine the general relationships between the set of indicators (tertiary education, employment in the services sector, foreign development investment (FDI), inflation, and internet diffusion) and China's trade in services (services exports and services imports).

Research Objective 3 is to identify the relative importance and significance of the various influential indicators of China's domestic business environment on the growth of its trade in services.

1.6 Research Contribution

Closing the three research gaps identified in Section 1.4 will contribute to the sparse theoretical economic literature available on the indicators of the business environment and their impact on the trade in services in China, the world's largest developing country. The findings of the study will also

provide an improved understanding of a refined set of indicators and their impact on trade in services for public and private entities.

Specifically, this current research will make three main contributions to the economic literature on China's trade in services and the domestic business environment:

This will be the first empirical research that identifies and tests the indicators of the Chinese domestic business environment on its trade in services. Moreover, there is no published research identifying the indicators at national level in a Chinese context and testing their impact on China's services trade. The findings of this research will aid China in its economic planning and will serve as a reference point for China's trading partners.

In addition, this research will identify the impact of the least to the most important indicators of China's domestic business environment on its trade in services. The findings will provide China's government with an indication of which indicators make the largest contribution to the growth of China's trade in services. This type of information may foster an increase in the trade in service between China and its trading partners.

Further, the findings of the study should encourage future academic research that investigates the domestic business environment and trade in services in other countries. A comparison can also be made between the results of this study on China and other countries that investigate the relationship between the domestic business environment and trade in services.

1.7 Research Overview

This thesis consists of five chapters. Chapter 1 introduces the research problems, research gaps, research objectives and contribution of this research. Chapter 2 reviews the literature on the domestic business environment, indicators of domestic business environment and China's trade in services. Chapter 3 discusses the research questions and modelling framework. Chapter 4 presents the results

of the empirical analysis undertaken in this current research. Finally, Chapter 5 discusses the empirical results, and offers conclusions and recommendations based on the results.

Chapter 2

Literature Review

2.1 Chapter Introduction

The literature on the trade in services, the business environment and the indicators of the domestic business environment is reviewed in this chapter. In particular, the review of the relevant literature focuses on China's trade in services and its domestic business environment. This chapter begins with an overview of the trade in services and the business environment. The development of China's services trade is described in Section 2.4. Section 2.5 presents a review of China's domestic business environment. Section 2.6 discusses the research models used to measure the trade in services. Section 2.7 and Section 2.8 present the indicators developed for China's domestic business environment, and trade control variables, respectively. Section 2.9 is the summary of this chapter.

2.2 Overall Reviews of Trade in Services

2.2.1 The Definitions and Classification of Trade in Services

The delineation between services and manufactured goods has been discussed in both an economic and marketing context. Scholars from both disciplines have agreed that, in general, there are four key characteristics that separate services from manufactured goods. The common and most cited characteristics are variability (heterogeneity). The classification of services has been dependent on the service exhibiting a combination of some of the characteristics. For example, health care encapsulates all four characteristics to some degree and is classified as a service in an economic and marketing context (Bateson & Hoffman, 1999; Clemes & Brush, 2005; Grönroos, 1990).

The Classical Definitions of Services in a Marketing Context

The definition of services has been discussed broadly in the marketing literature. Grönroos (1990) presented a range of representative definitions of services generated from the extant published literature (See Table 2.1). Grönroos (1990) pointed out that the listed definitions of services

summarised some perspectives of services however, they also had limitations. Grönroos (1990, p. 27) also provided a definition of services in a marketing context: “A service is an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems.”

Table 2-1 Definitions of services

Author/s	Definition of services
American Marketing Association (1960, p. 21)	Service-Activities, benefits, or satisfactions which are offered for sale, or provided in connection with the sale of goods.
Regan (1963, p. 57)	Services represent either intangibles yielding satisfactions directly (transportation, housing, or intangibles yielding satisfactions jointly when purchased either with commodities or other services (credit, delivery).
Judd (1964, p. 59)	Marketed Services-A market transaction by an enterprise or entrepreneur where the object of the market transaction is other than the transfer of ownership (title, if any) of a tangible commodity.
Bessom (1973, p. 9)	For the consumer, services are any activities offered for sale that provide valuable benefits or satisfactions; satisfactions; activities that he cannot perform for himself or that he chooses not to perform for himself.
Blois (1974, p. 157)	A service is an activity offered for sale which yields benefits and satisfactions without leading to a physical change in the form of a good
Stanton (1974, p. 545)	Services (are) separately identifiable, intangible activities which provide want satisfaction when marketed to consumers and/or industrial users and which are not necessarily tied to the sale of a product or another service.
Lehtinen (1983, p. 21)	A Service is an activity or a series of activities which take place in interactions with a contact person or a physical machine and which provides consumer satisfaction
Andresen et al. (1983, p. 6)	Services are any intangible benefit, which is paid for directly or indirectly, and which often includes larger or smaller physical or technical component.
Kotler & Bloom (1984, p. 147) and Kotler (1988, p. 477)	A service is any activity or benefit that one party can offer to another that is essentially intangible and does not result in the

	ownership of anything. Its production may or may not be tied to a physical product
Free (1987, p. 75)	The meeting of customer expectations in the course of selling and post-sales activity through providing a series of functions which match or better the competition in a way which provides an incremental profit for the supplier
Gummesson (1987, p. 22)	Services is something which can be bought and sold but which you cannot crop on your foot.

The characteristics of services have also been discussed in the previous marketing literature. Grönroos (1990, p. 28) summarised the most salient differences between physical goods and services (see Table 2.2).

Table 2-2 The main differences between physical goods and services

<i>Physical Goods</i>	<i>Services</i>
Tangible	Intangible
Homogeneous	Heterogeneous
Production and distribution separated from consumption	Production and distribution and consumption simultaneous processes
A thing	An activity or process
Core value produced in factory	Core value produced in buyer-seller interactions
Customers do not (normally) participate in the production process	Customers participate in production
Can be kept in stock	Cannot be kept in stock
Transfer of ownership	No transfer of ownership

The Definitions and Classification of Trade in Services in an Economic Context

In an economic context, Hill (1977) defined a service as “a change in the condition of a person, or of a good belonging to some economic unit, which is brought about as the results of the activity of some other economic unit, with the prior agreement of the former person or economic unit”. Hill’s (1977)

definition of services implies that the production and consumption of services must happen at the same time and in the same location. However, Barth (1999) argued that a single definition of services does not necessarily delineate them from physical goods. For example, Jensen (2011) explains that the development of technology has enabled some types of non-storable services (e.g. electricity) to be transportable, which means that the production and consumption of these types of services can be in different locations and times.

Many organizations also provide definitions of services. For example, six organizations jointly developed the Manual on Statistics of International Trade in Services (MSITS) (United Nations, 2012). The MSITS (2012, p. 8) manual defined “services are the result of a production activity that changes the conditions of the consuming units, or facilitates the exchange of products or financial asset. They cannot be traded separately from their production. Services are heterogeneous outputs produced to order, and typically consist of changes in the condition of the consuming units realised by the activities of the producers at the demand of the customers. By the time their production is completed, they must have been provided to the consumers.”

In addition, the classification of trade in services also differ depending on the source of the definition. For example, in order to cover the various characteristics of services, Sampson and Snape (1985) classified the trade in services into four categories:

1. Separated services where neither the consumer nor the producer need to move.
2. Demander-located services where the producer moves to the consumer.
3. Provider-located services where the consumer moves to the producer.
4. Footloose, or non-separated services, where both the consumer and the producer move.

Further, The General Agreement on Trade in Services (GATS) under the World Trade Organization (WTO) was the first multilateral agreement covering the important and growing area of trade in services among developing and developed countries which began in 1995 (World Trade Organization,

2017). The original definition and classification of trade in services under the (GATS) still applies to all the members of the (WTO), including China (World Trade Organization, 2017). The GATS definition and classification of trade in services is presented in the following section.

The GATS and Trade in Services

The GATS defines the trade in services based on the location of the supplier and the consumer at the time of the transaction (World Trade Organization, 2017). The trade in services is defined as the supply of a service:

1. from the territory of one Member into the territory of any other Member;
2. in the territory of one Member to the service consumer of any other Member;
3. by a service supplier of one Member, through commercial presence in the territory of any other Member;
4. by a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member.

Based on the definition, the GATS (World Trade Organization, 2017) classifies the trade in services into four modes:

- a) Mode 1. Cross-border supply;
- b) Mode 2. Consumption abroad;
- c) Mode 3. Commercial presence; and
- d) Mode 4. Presence of natural person.

The Main Differences between Trade in Services and Goods Trade

Copeland and Mattoo (2004) note that there are two major differences between services trade and goods trade. Firstly, cross –border trade is more important for most goods trade than for the trade in

services. The authors explain that some types of trade in services can facilitate sales through foreign direct investment (FDI) in a foreign affiliate, and therefore it is not necessary to register services at the borders. However, services not registered at the border makes the measurement of services trade more difficult when compared to the measurement of goods trade (Cattaneo & Walkenhorst, 2010, p. 71). Second, indenting the trade barriers for services tends to be more complicated when compared to the process applied to goods trade (Copeland & Mattoo, 2004; Stephenson, Findlay, & Yi, 2002). Copeland and Mattoo (2008) also consider that the liberalization of trade in services is often linked with a country's domestic regulatory reform. The authors report that the regulations vary across countries and these variations result in an increase in the complexity of measuring trade barriers in services.

Trends in Trade in Services

The global trade in services has increased significantly since the 1980's (see Figure 1.2). Jensen (2011) points out that a variety of technological changes has widened the scope for trade in conventional services, such as education and finance. In addition, increased labour mobility and an increasing number of skilled employee have facilitated the development of trade in services, and highlighted its importance in world trade (Stephenson & Hufbauer, 2010). Further, the WTO (2015) maintains that the growth of trade in services make a significant contribution to the reduction in poverty. Services export and import can increase the trade variety and attract foreign direct investment, which drive the competition, lower the prices and increase the quality (World Trade Organization, 2015).

The trade in service is also becoming increasingly important to economic growth, job creation and poverty reduction in the developing countries (Engman, Cattaneo, & Saez, 2010). In the developing countries, the average value added of services to GDP increased from around 40 per cent in 1965 to over 50 per cent in 2015 (United Nations Conference on Trade and Development, 2016). Services exports and imports in developing countries accounted for 30.1 per cent and 37.7 per cent of the total world trade in services in 2013, respectively (United Nations Conference on Trade and Development,

2016). Engman et al., (2010) consider that many developing countries are gradually liberalizing their services sectors to obtain resources and seize new business opportunities.

2.3 A Review of Business Environment

Commander and Svejnar (2011) and Cull, Navajas, Nishida, and Zeiler (2015) maintained that the quality of the business environment plays an important role in the performance of overall economic growth in developing countries and developed countries. Djankov, McLiesh and Ramalho (2006) examine the impact of the business environment on the economic growth in seven selected ASEAN countries. The authors illustrated that an improved business environment could increase the annual GDP growth in the selected countries. Commander and Svejnar (2011) also emphasise that a bad business environment could weaken a country's economic performance. In addition, Essnui, Berma, Shahadan, Ramlee, and Bin Mohd (2014) report that a country with a friendly business environment may attract more investors and subsequently increase productivity and lower unemployment. Gani (2011), and Gani and Clemes (2013) highlight the importance of the business environment on the growth of trade in selected gulf countries and selected OECD countries, respectively. Further, the World Bank (2016a) reports that a majority of the countries have instigated policies to improve their business environment in order to achieve a stronger economic growth and better trade performance in the global business arena.

Eruemegbe (2015) considers that the concept of the business environment is complex and consists of a series of variables. For example, Harrison (2014) note the major factors of the business environment included political, social, technologic, ethical, economic and legal factors. Harrison (2014) identifies five key sub dimensions of the business environment, culture, business ethics, internationalization, markets and competition, and technological change. The World Bank (2016a) has also investigated and identified the effects of eleven factors (starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency, and labour market regulation) of the business environment in 183 countries.

Commander and Svejnar (2011) report that the explanatory variables used in the measurement of the business environment in several published empirical studies are measured at three levels: country-level, industry-level, and firm-level. Scholars have used the three different levels of explanatory variables to investigate the effects of the business environment on different economic perspectives, such as job creation (Clarke, Li, & Xu, 2016) and the development of innovation (Fabová & Janáková, 2015).

2.4 A Review of China's Trade in Services

China's trade in services has been developing rapidly since the Chinese government implemented the policy of "reform and opening up" in late 1978 (Claus & Oxley, 2014). The Chinese Ministry of Commerce (2015) reports that China's trade in services rose to US\$604.3 billion in 2014, from US\$4.4 billion in 1982. Moreover, the National Bureau of Statistics of China (NBSC) (2015) reports that China's trade in services accounted for 11.78 percent of China's international trade and 6.3 percent of total global services trade in 2014. In 2014, the growth rate of China's services trade was also 7.6 percent, which was higher than the world average growth rate of trade in services at 4.7 percent (World Bank, 2016b).

China's main services trading partners are the USA, the European Union (with 27 member countries), Japan and Hong Kong (Tang et al., 2013; Wang, 2015). The combined trade volume with these countries and regions accounted for approximately 60% of China's total trade in services in 2014 (World Trade Organization, 2015). China FTA Network (2016) notes that China has recently signed nine Free Trade Agreements (FTAs) relating to services trade with the Association of Southeast Asian Nations (ASEAN), Pakistan, Chile, New Zealand, Singapore, Peru, Hong Kong, Macau, Costa Rica, Iceland, Switzerland and Korea by 2014. In addition, China's Ministry of Commerce (2016) also reported that China is negotiating on FTAs with Australia, Norway, Japan-Korea, Sri Lanka, and Maldives. Chen and Whalley (2014) argue that China is considered as one of the world's most important services trading partners in the global services trading market.

The statistical data from the NBSC (2015) showed that travel and transportation were the two dominate components of China’s services exports and imports during the last four decades. These two services industries accounted for approximately 50% of China’s total trade in services in 2014 (see Figure 2.1 and 2.2). Many scholars have indicated that China’s services trade has relied heavily on its traditional services industries, including travel, transportation and construction (Pan & Lv, 2013; Soo, 2012). Whereas, the high valued services industries (such as financial services, consulting, insurance and computer and information) accounted for a small proportion for China’s services trade, especially services exports (Pan & Lv, 2013).

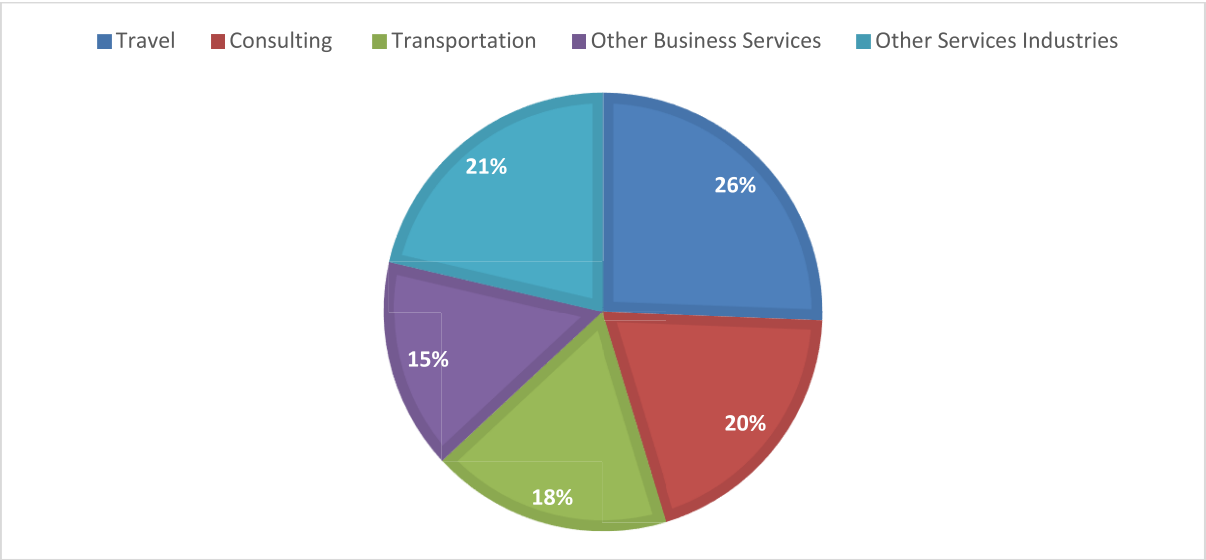


Figure 2-1 China’s exports of services by services industry in 2014 (NBSC, 2015)

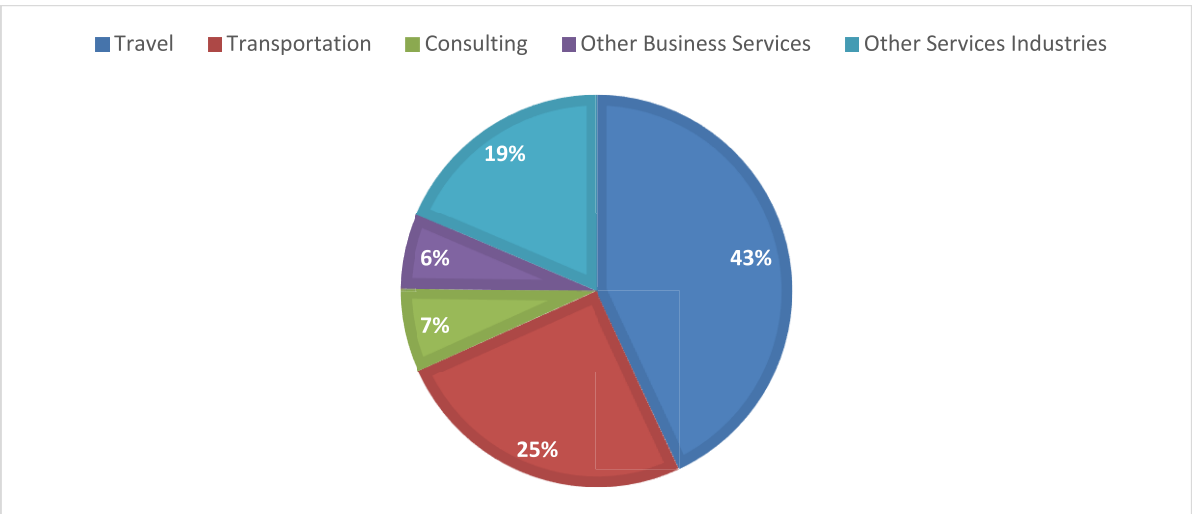


Figure 2-2 China’s imports of services by services industry in 2014 (NBSC, 2015)

China's services trade has also been more liberalized after China joined the WTO in 2001 (Antkiewicz & Whalley, 2005; Pan & Lv, 2013). China reported a remarkable increase in its trade in services after its accession to the WTO in 2001. China's implementation of its WTO commitments on trade in services under the GATS has provided more market access for services trade between China and its trading partners (Kanungo, 2005; Yu & Liu, 2012). For example, Yang's (2009) findings from analysing the trade in services between China and ASEAN note that China made commitments to open its 26 services-related industries for ASEAN countries in 2007. The significant growth of China's services trade is in parallel with the time frame of its economic reform and WTO accession, which is also as shown in Figure 2.3.

Further, Chen and Whalley (2014) demonstrate that the trade in services becomes one of the major components in the Chinese Twelfth Five-Year Plan (2011-2015). The importance of China's services sector and its trade in services has been emphasised in the Chinese Thirteenth Five-Year Plan (2016-2020) (Gardels, 2016). The Chinese government aims to reform its economic structure by strengthening and accelerating the development of its services sector from 2016 to 2020 (Haacke, 2015).

However, several issues in the development of China's services and its trade in services have been pointed out in the previous published literature. Sheng and Wang (2012) note that the overall development level of China's services sector lags behind the world average level and this acts to hinder the further development of China's services trade. For example, the value added of the services sector to China's GDP was 24.6 percent in 1978, and increased to only 47.8 percent in 2014 (World Bank, 2016b). However, the world average value added in services sector has reached over 70 percent in 2014 (World Bank, 2016a). In addition, Chen and Whalley (2014) find that the recent expansion of the trade in services in China is a corresponding phenomenon to the early stage of services trade development in most advanced economies (e.g. Japan, United States, Australia, OECD countries) and some developing countries (e.g. India, Indonesia). The percentage of trade in services to China's GDP

is low when compared to the average level of services trade in the low-income, middle-income, and high-income countries (World Bank, 2016a; Zheng et al., 2011) (see Figure 2.3).

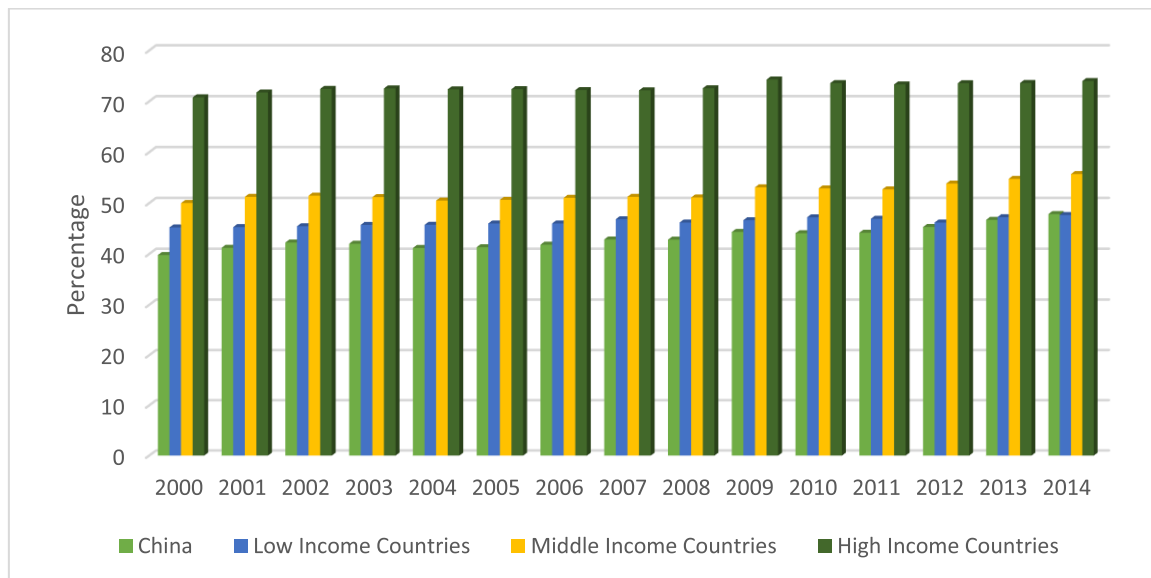


Figure 2-3 The percentage of trade in services in GDP: China, low income, middle income and high income countries (World Bank, 2016a)

China's openness in services trade is much lower compared to its merchandised trade. Thus, China's trade in services faces less competition and does not have a substantial comparative advantage in the global market (Marelli & Signorelli, 2011; Tang et al., 2013). The World Bank (2016b) reported that from 1990 to 2015, the volume of China's trade in services has remained subdued and relatively small when compared to the volume of China's merchandised trade (see Figure 2.4). Moreover, unlike its long-standing trade surplus in merchandise trade, China's trade in services has experienced a trade deficit since 1992, and this trend has increased markedly in recent years (Chen & Whalley, 2014) (see Figure 2.4). In addition, Sheng and Wang (2012) report that although China has made commitments to the WTO on opening its services sector, some services industries are still under strict Chinese government protection, such as China's financial and insurance industries. Voon and Mitchell (2010) also identify high barriers of entry into China's telecommunications services market.

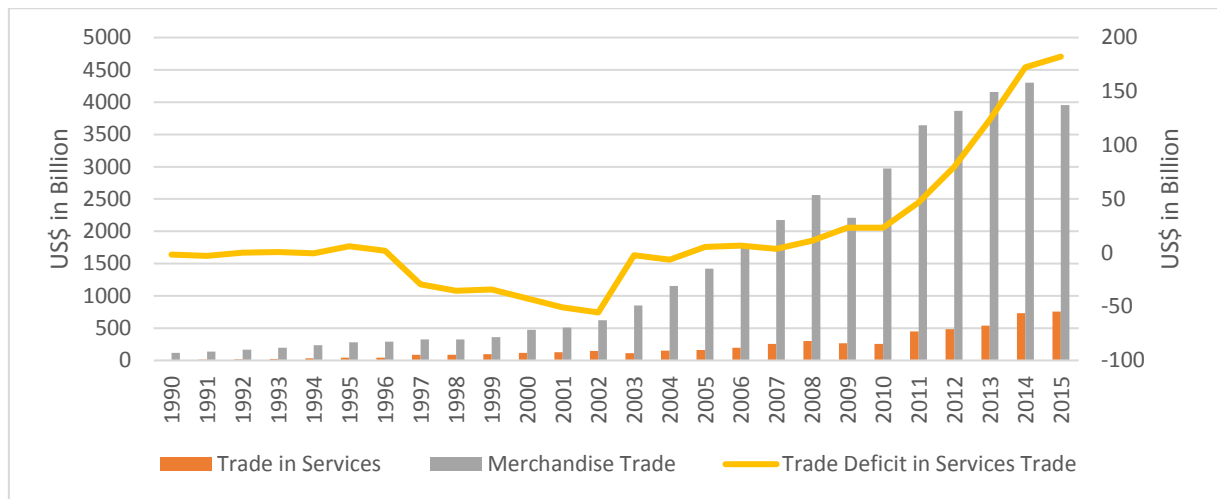


Figure 2-4 The volume of merchandise and service trade in China (US\$) (World Bank, 2016b)

Furthermore, the development of China's trade in services is unbalanced, which is reflected in its irrational services trade structure and unbalanced regional structure (Sheng & Wang, 2012). For example, China's services industries (e.g. transportation and travel) have been more advanced and developed than its high valued services industries (e.g. finance, and insurance) (Pan & Lv, 2013). However, technology-intensive and knowledge-intensive services still need to be exposed to more international and domestic competition to increase their share of GDP in the coming years (Tang et al., 2013; Zhang, 2010). In terms of China's unbalanced regional structure, the coastal regions have more developed modern service industries, whereas the developing central and western regions concentrate on labour-intensive traditional services (Tinbergen, 1962). Zheng et al., (2011) note that the general technical efficiency is different between coastal, central and west China. The authors suggest that this unbalanced efficiency is a key reason for regional imbalances in the development of China's services sector.

2.5 A Review of China's Domestic Business Environment

China's economic environment has been developed and improved steadily in recent years (Maxwell, 2012). China has shifted from a centrally planned economy to a market orientated economy since starting its market reforms in 1978 (Wong, 2013). Since 2014, China had the second largest economy in the world after the United States when measured by nominal GDP, and the world's largest economy

by purchasing power parity (PPP) (World Bank, 2016b). However, China remains classified as a developing country as its per capita income is still behind those of the advanced countries (Kopra, 2013; Wong, 2013). The World Bank data (2016b) reported that 82 million Chinese people still lived below the national poverty line of US\$2 per day at the end of 2014. Zhang, Guo and Zheng (2012) highlight that China also faces demographic pressures related to an aging population and the internal migration of labour. The new targeted China's GDP growth rate in the next five-year is 6.5 percent, which is lower than its targeted GDP growth rates in the last two Five-Year Plans (Reeves & He, 2015). China's enterprises, in particular, small and medium-sized enterprises, are likely to face a challenging business environment in the next decade (World Trade Organization, 2014; Yan & Chew, 2011). China's market transition to consumption-led growth is intended to assist non-resource industries to contribute to its economic growth (Reeves & He, 2015).

Chinese legislators have implemented a series of significant policy adjustments for improving its business environment for both domestic and foreign investors (Maxwell, 2012). For example, China's business registration system was reformed in the Amendment of the Corporate Law in 2014, which reduced the cost of the registered capital threshold for enterprises (World Trade Organization, 2014). In terms of the relationship between the business environment and China's trade in services, the Chinese government has created more openness in its services industries and continued to encourage non-government investors to increase their investment in its services sector (Zheng et al., 2011). However, compared with the development of China's trade in goods, its trade in services is progressing at a relatively slow pace and is subject to imbalanced government policy support (Li, 2012).

Further, Yu and Ramanathan (2012) indicate that the Chinese culture also impacts on its business operations and limits the effectiveness of China's business practices implementation. Traditionally, China has concentrated on promoting its agricultural and manufacturing sectors rather than the services sector (Liu & Li, 2012; Nissan et al., 2011; Waldron, Brown, & Longworth, 2006). In the Twenty-First century, China's increased income growth and technology advancements have boosted the

demand for its services and this has acted to increase the importance of China's trade in services (Chen & Whalley, 2014).

Since 2002, the World Bank Group has conducted the Doing Business projects on investigating and measuring the business environment in 189 economies and selected cities, including China (World Bank, 2016a). The business indicators examined by the World Bank are: starting a business; dealing with construction permits; getting electricity; registering a property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts and resolving insolvency (World Bank, 2016a).

Doing Business uses questionnaire instruments to collect the information from firms based in Beijing and Shanghai. Figure 2.5 presents China's ranking of the 10 indicators among the 189 economies in 2015. China's doing business ranking declined from 83 in 2015 to 84 in 2016. During the thirteen-year study period, the results of the Doing Business projects reveals and highlights that China has made improvements in easing its business environment by mainly reforming: paying taxes, starting a business, getting credit, enforcing contracts, and dealing with construction permits (World Bank, 2016a). However, the Chinese business environment still lacks strengths in the area of business regulations (World Bank, 2016a).

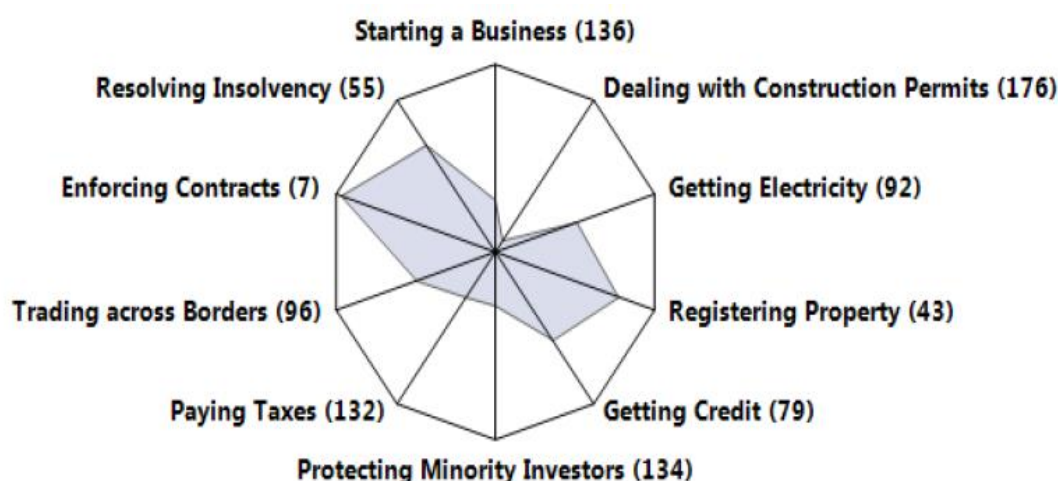


Figure 2-5 China's ranking on *Doing Business* topics in 2015 (Scale: Rank 189 centre, Rank 1 outer edge) (World Bank, 2016a)

2.6 Overview of Research Models

2.6.1 Representative Research Models Used Regarding to Trade in Services

Francois and Hoekman (2010) indicate that the published literature on the trade in services has increased since the first papers were written in the mid-1980s. Scholars have developed conceptual research models and analysed the pertaining data using quantitative methods to investigate the relationships between various explanatory variables and the performance of the trade in services in different countries and regions. The gravity model and various structural models have been used repeatedly in the published empirical research to examine the impact of the trade in services.

Karam and Zaki (2013) point out that the gravity model has been widely applied in research that has identified the determinants of the trade in services between two countries, or between one country and its trading partners. Kimura and Lee (2006) note that Tinbergen (1962) initially developed a gravity model to empirically examine the merchandise trade between countries. Karam and Zaki (2013) report that Francois (1993) was one of first researchers to apply the gravity model to the US bilateral trade in services. Moreover, the standard independent variables in the gravity model used in previous studies include: bilateral trade cost, intra-sectoral elasticity of substitutions, distances between trading partners, per capita income, and gross domestic product. Table 2.3 shows the most recent empirical research identifying the determinants of the trade in services using the gravity model.

In terms of multiple regression modelling, scholars have used multiple regression modelling, to identify and measure the determinants of the trade in services in a selection of countries. Examples of the published empirical research that examines the relationship between the growth of trade in services and the explanatory variables used in structural equation modelling to measure the relationship between the variables of demand and income elasticities and the trade in services are shown in Table 2.4. In the published empirical studies shown in Table 2.4, the growth of exports is a function of the exchange rate and world income, and the growth of imports is a function of the exchange rate and a country's domestic income. The real exchange rate is used as the measure of price elasticity, and the variable of gross world/domestic product (GDP) is used as the measure of income elasticity.

2.6.2 Research Models Used Regarding to China's Trade in Services

The gravity model is also used in the empirical studies on China's bilateral trade in services. For example, Tang et al., (2013) use the gravity model to examine the effects of the standard gravity variables and selected variables on the performance of the bilateral trade in services between China and OECD countries. The authors found the variables of China's GDP, the value-added of services, and ICT in partner countries were positively and significantly related to the level of trade in services in China. While the variables of restrictive regulations in the partner OECD countries negatively and significantly impacted on China's trade in services.

Balassa's (1965) revealed comparative advantage (RCA) index is used to investigate the comparative advantage of China's bilateral trade in services (Nath et al., 2015), and China's services sectoral trade (Chen & Whalley, 2014). For example, Nath et al., (2015) use the RCA index to measure the comparative advantage between U.S. bilateral services trade with China and India. In the RCA index (illustrated below), X is the value of the U.S. services exports j ($j=1,...,n$) to country i (China or India). M is the value of services import to the U.S. from China or India. Nath et al., (2015) found that the U.S. had a comparative advantage in its trade in services when compared to China and India. However, in recent years, India and China gained a comparative advantage in their modern service industries, such as computer and information services (Nath et al., 2015).

$$RCA_{ij} = \frac{\left((X_{ij}) / \left(\sum_{j=1}^n X_{ij} \right) \right)}{\left((X_{ij} + M_{ij}) / \left(\sum_{j=1}^n X_{ij} + \sum_{j=1}^n M_{ij} \right) \right)}$$

Published empirical research using structural modelling to examine China's trade in services is sparse. Several research articles concentrating on China's trade in services only present and compare annual data sets of China's overall trade in services in a discussion based format (see Maxwell, 2012; Soo, 2012). While the relationships among variables examined in the gravity model are based on mathematical formulas, structural modelling is not used in the empirical estimation. Thus, there is a

research gap in the literature, as to date, no researchers have identified or empirically examined a set of determinants impacting on China's trade in services using multiple regression modelling.

2.6.3 Research Models on Measuring Business Environment and Trade

To date, Gani (2011), and Gani and Clemes (2013) have conducted two empirical based research studies that have analysed the effects of the business environment on trade performance. Gani (2011), and Gani and Clemes (2013) use structural equation modelling to examine the effects of the business environment on overall trade in the Gulf Cooperation Council countries, and overall trade in services in the selected low-income, middle-income and high-income countries, respectively. A summary of Gani's (2011), and Gani and Clemes' (2013) research is presented in Table 2.5.

Table 2-3 The gravity model and trade in services

Author/s	Countries/Regions	Variables/Indicators	Main Findings
Marel & Shepherd (2013)	103 countries based on publicly available comparable information on services policies from the World Bank.	<ul style="list-style-type: none"> The dependent variable was cross-border services exports: telecommunications, finance, insurance, transport, retail and professional services. STRIs indicator, the OECD's Product Market Regulation indicators. Standard gravity model variables (distance, interest, language RTA, EU. Sectoral data were from 2005 to 2012 	<ul style="list-style-type: none"> The level of policy restriction had impact on trade in services. STRI was found to be statistically significant on trade flows.
Karam & Zaki (2015)	Selected 21 countries from the Middle East Economic Association (MENA) region	GDP; GDP of the partner country; the population of speak English language; colonized by France, the UK or Spain; latitude; member of WTO; WTO commitment. Data were from 2000 to 2009.	<p>Both GDP and GDP of the partner country had a positive and statistically significant impact on the trade in services in the selected countries.</p> <p>English language and distance were insignificant.</p> <p>The WTO member had a statistically significant and positive impact on services exports, services imports and trade in services.</p> <p>WTO commitment had a positive and statistically significant impacted on trade in services.</p>
Crozet, Milet & Mirza (2016)	French and selected 26 OECD countries. Firm-level data on exports of professional services	Domestic regulation; Firm-level characteristics; Institutions; Trade cost; Borders; Export Goods; Distance between French and 26 OECD countries. Data were in 1998, 2003 and 2008	<p>The variable of domestic regulation (Non-Manufacturing Regulations) has a negative and statistically significant impact on the decision to services exports and the volumes of exported by each firm.</p> <p>The variable of Destinations is found insignificant impact on the firm-level export performances.</p> <p>The variable of export performances has insignificant impact for firms in French.</p>

Table 2-4 Structural equation model and trade in services

Author/s	Countries/Regions	Variables/Indicators	Main Findings
Marquez (2006)	The United States	Income elasticity; price elasticity. (Quarterly data between 1987 and 2001).	The income elasticity for US services exports was significantly greater than the income elasticity for use services imports.
Thomas (2016)	India	Real exchange rate; Indian GDP, OECD countries' GDP. (Quarterly data from 1996-97 Q1 to 2011-12 Q4).	OECD countries' GDP had a positive and statistically significant on the growth of India's services exports. Real effective exchange rate had a negative and insignificant impact on the growth of services exports. India's GDP and the real effective exchange rate were both positively and statistically significant on the growth of India's services imports.
Sahoo & Dash (2017)	India	World demand for services imports; real effective exchange rate; infrastructure index; telecom density; average years of school, financial development index; domestic credit provided by banks % of GDP; manufacturing exports % of GDP; FDI inflows % of GDP; institutions; R &D expenditure % of GDP. (Data period was between 1980 and 2013).	World demand and manufacturing exports had positive and statistically significant impact on India's services exports. Real effective exchange rate had a negative and statistically significant impact on India's services exports. The competitiveness of India's services exports was improved by the availability of quality and quantity of telecom, internet and electronic infrastructure. Human capital (gross tertiary enrolment ratio) was positive and statistically significant for services exports.

Table 2-5 The domestic business environment and trade

Author/s	Country/Region	Variables/Indicators	Main Findings
Gani (2011)	Gulf Cooperation Council countries (Kuwait, Oman, Saudi Arabia, and United Arab Emirates)	<ul style="list-style-type: none"> • Trade control variables (real exchange rate, investment, foreign direct investment). • Indicators of business environment (time required starting contract, time required to register a property, time required enforcing a contract, and time required to resolve insolvency) 	<p>The time required to start a business and the time required to resolve insolvencies had a negative and statistically significant impact on imports.</p> <p>The time required registering a property, the time required to enforce a contract, and the time required to resolve insolvencies had a negative and statistically significant impact on exports.</p>
Gani and Clemes (2013)	Selected low-income, middle-income and high-income OECD countries	<ul style="list-style-type: none"> • Trade control variables (Real effective exchange rate, world income, domestic income, tariff). • Indicators of domestic business environment (cost of doing business, contract enforcement, protection of property rights, dispute resolution, the strength of legal rights, and internet diffusion). 	<p>The domestic business environment had impact on the growth of trade in services.</p> <p>The effects of indicators on services exports and imports in the selected countries vary.</p>

2.7 Indicators of Domestic Business Environment (DBE)

2.7.1 Indicators of DBE in Previous Studies

Demirguc-Kunt, Love, and Maksimovic (2006) use firm-level data from the World Business Environment Survey (WBES) in 1999 to compare the relationship between the business environment and the organizational decisions of businesses in a selection of fifty-two countries. The WBES is a survey designed to interview firm managers and generate comparative measurements under the topics of corruption, judiciary lobbying, and the quality of the business environment (Kaufmann & Stone, 2000). The WBES covers over 10,000 firms in 80 countries. However, the time frame of the survey is only 1999 and 2000 (Kaufmann & Stone, 2000). Demirguc-Kunt et al., (2006) estimate the effects of law and order, creditor and shareholder rights, duration of entry, tax disadvantages, absolute priority, time in bankruptcy, and percent of bankruptcies on firms' organizational choices. The authors reported that a stronger business environment has spill over benefits on developing financial and legal systems.

Yan (2010), and Yan and Chew (2011) use a self-developed questionnaire and regression analyses to investigate the relationship between the business environment and the performance of SMEs in China. The authors propose five items of environment dynamism: economic condition, development of legal system, project service technology, reform of construction industry and service efficiency of government departments. The results of the two studies indicate that the factors of environment dynamism are not related to the performance of SMEs in China.

Zhang, Huang and Liu (2012) find that the business environment factors (labour costs, currency exchange rate, market size, transportation infrastructure, logistics costs, import and export tariffs, labour skills, tax and land incentives) have an influence on the location decisions of global manufacturing firms. Zhang et al., (2012) focus on the factors affecting global manufacturing location changes in the Chinese Greater Pearl River Delta (GPRD) area. The findings indicate that the Chinese currency appreciation, rising labour costs, and highly volatile oil prices negatively affect the GPRD's competitive advantages.

Elliott, Jiang, Redding, and Stening (2010) test economic, political/legal, social/cultural and technological issues to forecast and identify trends in China's business environment in the next decade. The authors use the Delphi technique (Ono & Wedemeyer, 1994) and find that the reforms and improvement in competitiveness of China in both political and economic affairs, taxation system, banking sector and capital markets, and access to resources all have significant impacts on determining the level of China's business environment.

Essnui et al. (2014) examine the effects of business environment factors on the firm development in three Libyan cities. Structural Equation Modelling is used in this study to test the relationships between the growth sales of the firms and the factors: access to finance, corruption, infrastructure, business regulations, crime, competition, and human capital. The authors illustrate that corruption, crime, financing, infrastructure, business regulations and human capital are significantly correlated with the growth of the firm's sales.

Bah and Fang (2015) use panel data between 2006 and 2009 from the World Bank Enterprise Surveys (WBES) to measure the impact of the business environment on output and productivity for Sub-Saharan African countries. The WBES topics contain corruption, crime, finance, firm characteristics, gender, informality, infrastructure, innovation and technology, performance, regulations and taxes, trade and workforce (World Bank, 2015b). The empirical results in Bah and Fang's (2015) study confirm that government regulations, poor infrastructure, corruption and crime significantly and negatively impact on the business environment in the selected African countries.

Gillanders and Whelan (2014) note that the Doing Business indicators have become key factors that are widely used as instrumental regression variables in economic growth equations. de Tray (2010) reviews the Doing Business survey in 2009 on the business environment in five core Central Asia countries (Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan), and four Greater Central Asia countries (Armenia, Azerbaijan, Georgia and Mongolia). The author lists and compares the indicators ranking of each country. de Tray (2010) summarises that the nine Central Asian countries

need to significantly improve the ranking of the business environment indicators in order to strengthen their competitiveness in both domestic and international investment.

Commander and Svejnar (2011) estimate the relationship between the business environment and firm performance in 26 transition countries using the data from Business Environment and Enterprise Performance Survey (BEEPS) in 2005 and 2002, the Doing Business indicators in 2003 and 2006, and the Heritage Foundation indicators of business environment in 2001 and 2004, respectively. Based on the results, Commander and Svejnar (2011) illustrate that the business environment indicators retain few explanatory powers on firm performance. However, ownership and competition had a stronger impact on firm performance.

Maxwell (2012) discusses and compares a selection of five Doing Business indicators relating to government regulations/political-legal environment, economic reforms, labour market conditions, attitude towards foreign direct investment and the marketing base in 2011 between China and India. According to the ranking of Doing Business indicators in China and India, the author concludes that China had a more conducive regulatory environment than India in 2011.

Gani and Al-Abri (2013) use the Doing Business indicators and investigate the effects of five selected Doing Business indicators (business start-up procedures, contract enforcement, property rights, insolvency and pay taxes) on FDI inflows in Gulf Cooperation Council countries (Oman, Kuwait, Saudi Arabia and United Arab Emirates) using annual data from 2003 to 2010. A balanced of payments structural model is used in Gani and Al-Abri's (2013) study. In addition, Gani and Clemes (2015) also adopt business indicators from the Doing Business: building a warehouse, starting a business, enforcing contracts, registering a property, paying taxes, trading across borders, and investor protection, to examine the effects of business environment on FDI inflows in the selected Pacific Island Countries between 2003 and 2011. The empirical results of Gani and Al-Abri (2013), and Gani and Clemes' (2015) studies both prove that business environment has an impact on attracting FDI in these countries. Specifically, Gani and Al-Abri (2013) find that starting a business, the time required to enforce a contract, the time required to register a property and the time required to resolve insolvency matter

for FDI inflows in the GCC countries. Gani and Clemes' (2015) results illustrate that cost of doing business, time required to resolve insolvency, time required to build a warehouse, and the strength of legal rights are fundamental in FDI inflow in the Pacific Island countries.

To date, only Gani and Clemes (2013) have conducted an empirical study that examines the relationship between the domestic business environment indicators and services trade in the selected low-income, middle-income, and OECD countries. China is included in the middle-income category of countries in the study, however, the authors present aggregate results only for each income category. The empirical results indicate that in the category of middle-income level countries, dispute resolution, contract enforcement and property rights negatively impact services exports. The effect of contract enforcement and property rights on services imports are negative in the middle-income category of countries. However, the effect of legal rights on services imports is positive in the middle-income category of countries.

To date, there is no published empirical research on investigating the effects of the indicators of the domestic business environment on China's trade in services. This current research has identified five testable indicators of the domestic business at national level in a Chinese context. The discussion of the selection of the five indicators is presented in Section 2.7.2.

2.7.2 The Constructed Indicators of DBE Used in the Current Research

Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is deemed as a key source for promoting economic growth and trade in most of the developing countries (Govil, 2013). Kok and Bernur Acigoz (2009) indicate that FDI is an important and direct channel to introduce new technology, knowledge, and other intangible assets through cross border trade. The authors maintain that FDI increases productivity efficiency and improves resource allocation in the developing countries, including China. The level of FDI is also considered as one important international effect reflecting trade liberalization and the degree of a country's openness (Kasper, van Helsdingen, & de Vries Jr, 1999; Kok & Bernur Acikgoz, 2009).

Liargovas and Skandalis (2012) report that foreign investments are attracted to more open economies in the developing countries and regions.

Sohn (2016) explains that FDI into China has increased rapidly in real term since 1992 (see Figure 2.6), and it makes a significant contribution to China's economic development. The UNCTAD (2015) reported that China was the largest FDI destination among the developing countries in the last two decades, and was the world's largest FDI recipient in 2014. Feng (2011) also point out that the trend of FDI inflows into China's services sector has increased since 2000.

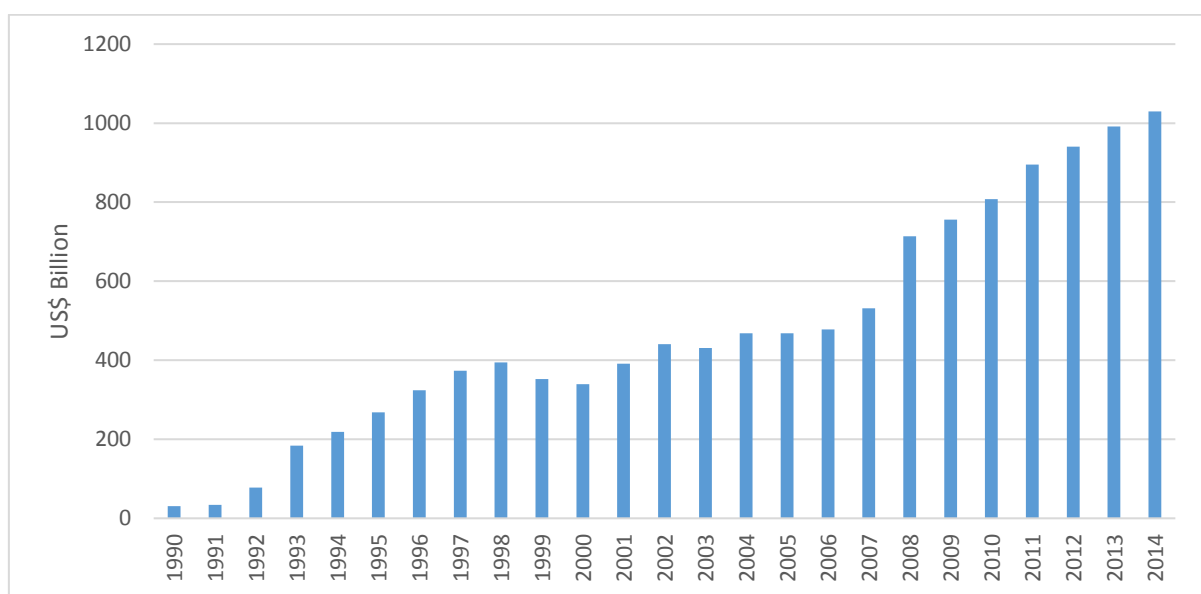


Figure 2-6 FDI inflows into China between 1990 and 2014 (World Bank, 2015)

Several scholars have highlighted the important role of FDI in economic growth (see Ipek & Kizilgöl, 2015; Morrissey & Udomkerdmongkol, 2012; Seyoum, Wu, & Lin, 2015). The effects of inward FDI on the host country's output growth also have been investigated in the published literature (Basu, Chakraborty, & Reagle, 2003; Nyen Wong & Khoon Goh, 2013). More recently, Dash and Parida (2012) demonstrate that the focus has shifted from an overall FDI analysis to FDI's impact on the growth of services and services trade. Ipek and Kizilgöl (2015) argue that the effects of FDI on the services sector varies in different countries.

Morrar and Gallouj (2016) investigate the impact of FDI on the growth of the services sector in Palestine by using services sector-level panel data between 1995 and 2009. The empirical results

indicate that FDI has a limited effect on the growth of services productivity. While, Arnold, Javorcik, and Mattoo (2011) research on services liberalization in the Czechoslovakia Republic indicates that permitting FDI inflows into the services sector contribute to improved availability, range and reliability of services.

In addition, the effect of FDI on the trade in services has also been examined for different countries. Tang et al., (2013) use the gravity model for trade in services to investigate the key factors that affect bilateral trade between China and OECD countries. The authors indicate that the variable of FDI is positive and significant with bilateral trade in services, which suggests China should continue to increase the efficiency of China's services through FDI. Wong and Goh (2013) examine the relationship between outward FDI and the trade in services in Singapore using the Granger causality test. The findings in the study show no evidence of any causal linkages between FDI and the trade in services in Singapore. The authors suggest that FDI is not capable of increasing Singapore's services trade.

The results in Wong, Tang and Fausten's (2009) study also show that positive spillover effects are present between inward FDI and services trade in Malaysia and Singapore. The authors find that FDI inflow strengthens the foundation for trade in services, and the growth in services trade attracts FDI inflows to the two countries.

The linkage between FDI and the trade in services is also explored in Tang and Wong's (2011) study for a transition economy in Indo-China–Cambodia. The authors' find that FDI is capable of promoting the exports of services, while FDI inflow is drawn into the countries sampled through services imports. The VAR framework is used to analyse the empirical results, which show that inward FDI positively and strongly promotes the growth of Cambodian services exports. Moreover, the authors find that services imports attract and encourage FDI inflows into Cambodia.

Despite the fact that FDI has become an essential factor that stimulates service trade development in many economies, empirical studies on the relationship between FDI and China's services exports and

imports are sparse. Therefore, FDI is included as one indicators of the domestic business environment in this current research.

Employment in the Services Sector

Fisher-Clark (F&C) (Clark, 1940; Fisher, 1935) introduced a three-sector approach (primary, secondary and tertiary sectors) to improve the understanding of the relationships between the sectors under investigation. Clark (1940) indicated that a gradual shift in employment and value added from the agricultural and manufacturing sectors to the services sector was inherent in the process of economic development. The results of F&C original research are supported by the findings in a later study by Breitenfellner and Hildebrandt (2006). Several scholars point out a beneficial effect for services arising from factors such as employment development, technological innovation (Evangelista & Savona, 2002), trade liberalization (Melikhova, Baz'ó, Holubcova, & Camacho, 2015; Yanikkaya, 2013), and FDI (Dash & Parida, 2012).

Tregenna (2009) notes that deindustrialisation is generally considered as a decline in the share of manufacturing employment in total employment, which has been observed in many high-income countries and some middle income countries. The International Labour Organization (ILO) (2015) reports that internationally, employment in the manufacturing sector is expected to reduce continuously, and that several manufacturing activities will be dominated by service-related occupations in the future. In addition, the share of service-related jobs in total employment continues to increase, while the number of employees in the agricultural and manufacturing sectors gradually reduces (Sasaki, 2007; Sethi & Kaur, 2015). The ILO (2018) report that the services sector accounted for over half of total global employment since 2015, and the share of labours in the services sector increased from 34% in 1991 to 51% in 2017. In the developed countries, the occupational structure is transforming from an industry-dominated to a services-dominated employment structure (Gonzales, Jense, Kim, & Nordås, 2012). For example, approximately 70 percent of total employment is in the services sector in OECD countries (World Bank, 2015b). Gonzales et al. (2012) note that the developed countries have also benefited from a comparative advantage resulting from the employment growth

in their services sectors. In addition, some developing countries, such as India and Philippine, are experiencing the similar change of rising employment in their services sectors (Nayyar, 2013; Noland, Park, & Estrada, 2012).

China's employment growth in its services sector also contributes to the job expansion in China (Jiang, 2013). The impact of employment on the trade in services was investigated in China and India in Liu and Yang (2015) study, and the results demonstrate that people changing their employment from the agricultural sector to the services sector has a significant effect on the economic structural transformation. The National Bureau of Statistics of China (NBSC) (2015) reported that the number of employees has gradually shifted from the agricultural and manufacturing sectors to the services sector in China (see Figure 2.7). The proportion of service employment to total employment increased from 13.5 percent in 1982 to 40.6 percent in 2014 (National Bureau of Statistics of China, 2015). The share of employment in the manufacturing sector rose from 18.4 percent to 29.9 percent, while the share of employment in the agricultural sector decreased from 68.1 percent to 29.5 percent from 1980 to 2014 (National Bureau of Statistics of China, 2015).

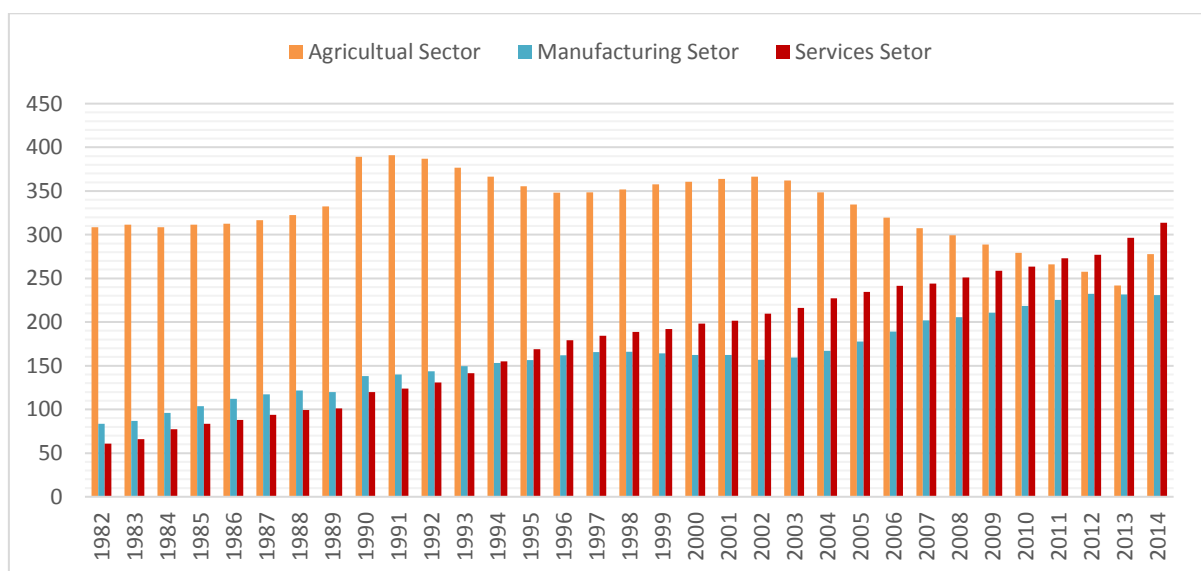


Figure 2-7 The Number of Employed People in China's Agricultural, Manufacturing and Services Sectors (in millions) (National Bureau of Statistics of China, 2015)

In particular, the ILO (2015) reported that the employment rate in China's services sector was 40.6% in 2014 (29.5% in the agricultural sector, and 29.9% in manufacturing sector, respectively). In 2014, China's services sector was, for the first time, the leading sector that attracted and contributed to new job positions among China's three major sectors (International Labour Organization, 2015). Wu (2015, pp. 620-621) highlights that "the service sector is the only sector in China where net job growth is positive". Moreover, Lam, Liu and Schipke (2015) note that China's labour market has been driven by the expansion of the services sector under the "new normal" since 2008.

Tertiary Education

Tertiary education is deemed as one of the important factors of human capital that profoundly promotes knowledge-intensive economic development (Jalil & Idrees, 2013). For example, the OECD (2012) reported that labour income growth among employed individuals with tertiary degrees contributed more than 50 percent of the GDP growth in OECD countries between 2002 and 2012. Kimenyi (2011) and He (2015) note that tertiary education can improve employees' skills and capacity-building orientation, which provides employees with better opportunities to express their creative capacities and leads them to greater participation in globalization. In addition, tertiary education has positive effects on modifying a country at society level, as it contributes to social capital, such as better governance and higher life expectancy (Geloso-Grosso, 2007).

In terms of China's tertiary education, Tan (2013) notes that China's higher education has significantly expanded, both in terms of the number of colleges and universities, and the tertiary student enrolment in various subjects. There were 2529 colleges and universities in China, including state and non-state/private institutions, with 26.48 million enrolled students at the end of 2014 (National Bureau of Statistics of China, 2015). China's gross tertiary enrolment ratio increased significantly from only 7.7 percent to 39.4 percent from 2000 to 2014 (World Bank, 2016b). He (2015) indicates that tertiary education development has been given strong support from the Chinese government, as it has implemented multiples education-related policies since the Reforming and Opening Up in 1978.

Despite the increasing number of tertiary enrolled students and graduates, China has only conducted four economy-wide population censuses since 1978, in 1982, 1990, 2000, and 2010 relating specifically to employees' educational background (National Bureau of Statistics of China, 2011). Table 2.6 and 2.7 present the data from the published 2010 census and 2000 census, showing that the main selected service-related industries (Construction and Transportation, Finance, Real estate and Education) had larger numbers of employees with higher educational level, compared to the agricultural and manufacturing sectors. In particular, from 2000 to 2010, the number of higher educated employees increased markedly in the financial industry in China. Holz (2008) points out that the agricultural sector requires employees with less educational level when compared to the number of educated employees required to work in the manufacturing and services sectors.

Ding and Knight (2011) prove the importance of tertiary education in China's economic growth and human capital development. The authors find that tertiary education enrolments have stronger positive effects on China's GDP growth, when compared to the secondary education enrolment. This finding is consistent with Harris, Knight and Xu's (2011) findings that provides evidence that tertiary education has a large impact on China's GDP. In addition, Tang, et al., (2013) include the tertiary school enrolment as one of the explanatory variables to investigate the comparative advantage between China's trade in services and its main trading partners. However, the authors find that tertiary enrolment has a positive but statistically insignificant effect on the development of China's trade in services.

Table 2-6 The number of sectoral employees of different education levels in China in 2010

Sectors/ Industries	Uneducated	Primary Education	Junior Secondary Education	Secondary Education	Diploma	Bachelor	Postgraduate
Agriculture	2166108	12860682	17343271	2007314	171095	32870	2879
Manufacturing	90112	1581914	6784566	2418523	775099	374151	34875
Construction	43553	781974	2371551	489395	151698	77478	4213
Transportation	12981	255128	1388087	613659	188842	81679	4328
Finance	302	6911	69573	140621	189668	157389	16698
Real estate	3500	41012	161910	131740	88014	51154	3691
Education	2189	27808	148817	297226	549211	547901	77847

Source: Tabulation on the 2010 Population Census of The People's Republic of China. National Statistics Bureau of China, 2011.

Table 2-7 The number of sectoral employees of different education levels in China in 2000

Sectors/ Industries	Uneducated	Primary Education	Junior Secondary Education	Secondary Education	Diploma	Bachelor	Postgraduate
Agriculture	3892038	18566496	17354035	1792683	49055	9644	743
Manufacturing	80819	1369649	4462806	1421859	348490	129612	5965
Construction	20201	405343	985770	229338	61749	20913	647
Transportation	12537	240525	875668	357924	87937	28829	1388
Finance	457	5532	48679	101910	121304	39452	3419
Real estate	965	9511	44580	39589	30109	10714	799
Education	4043	37718	194610	229924	493504	238451	20935

Source: Tabulation on the 2010 Population Census of The People's Republic of China. National Statistics Bureau of China, 2001.

Inflation

Inflation is a criterion used to measure the performance of a country's economy and trade openness (Munir, Mansur, & Furuoka, 2009). High inflation may cause economic problems, such as market imperfections and deficits in balance of payments (Guo, 2013). However, slowing inflation may signal a less than healthy economy and disinflation is a sign that demand for goods and services is insufficient to match the supply of goods and services in an economy (Mani & Mishra, 2014). Several empirical studies on various countries have evaluated the relationships between inflation and economic growth, and inflation and trade openness (Abou-Ali & Kheir-El-Din, 2009; Munir et al., 2009; Rit, 2014). However, the results of these studies have been inconclusive: both positive and negative associations

in the relationships between inflation-growth and inflation-openness are reported in studies on different countries (Sehar, Hamid, & Malik, 2015). For example, Mani and Mishra (2014) indicate that rate of inflation positively impacts on services growth and GDP growth in India. However, Afzal, Malik, Butt and Fatima (2013) find that rate of inflation negatively impacts on trade openness in Pakistan.

Liang (2014) uses data that combines financial liberalization under the WTO to empirically investigate the factors that impact on trade liberalization in banking services in the WTO members. The results of Liang's (2014) study show that rate of inflation has a negative effect on increasing the degree of financial liberalization. The author explains that unstable and unpredictable prices are created by inflation that impacts on investment decisions. Moreover, inflation can lower the competitiveness of domestic companies vis-à-vis foreign companies, which tends to stimulate imports and hinder exports (Ito, 2007; Liang, 2014).

Wahid, Shahbaz and Azim (2011) also test the correlation between inflation and financial development by using the ARDL bounds testing approach and Error Correction Method (ECM) in a study on the Bangladesh economy. The empirical findings show that high continuing inflations adversely affects the performance of financial markets. The findings suggest that inflation decreased the efficiency of the financial sector in Bangladesh from 1985 to 2005. Odhiambo (2012) finds similar results in a study on Zambia, showing a negative relationship between higher rates of inflation and the financial sectors performance between 1980 and 2011.

Chaudhry, Ayyoub and Imran (2013) empirically analyse the impact of inflation on the three main sectors (agricultural, manufacturing and service sectors) in Pakistan using annual time series data from 1972 to 2010. The results in this study show that inflation negatively impacts on manufacturing sector growth in Pakistan. However, Pakistan's services and agricultural sectors growth rates are positively impacted by the rate of inflation. In particular, the authors find a significant and positive effect between the rate of inflation and the rate of growth in Pakistan's services sector.

Ekor, Saka and Adeniyi (2015) point out the importance of the inflation as it impacts on a country's trade competitiveness, capital inflows/outflows, and economic growth. The authors examine the trade and investment relationship between South Africa and the BRIC (Brazil, Russia, India and China) by including and testing the inflation in their analysis. The empirical results show that inflation accounts for the highest variation in South Africa's exports to, and imports from, Brazil and China. The results suggest that South Africa's average inflation must be low and stable in order to maintain its competitiveness with Brazil and China. The authors also demonstrated that the rate of inflation explained the greatest variation in Brazil's GDP.

Tang, Wang and Wang (2014) stress that the rate of inflation has an important role in the performance of China's macro economy and its societal development. China's inflation statistics are equally notable to China's GDP growth over the last three decades (see Figure 2.8) (World Bank, 2016b). China experienced several major high inflations in the late 1980s, early 1990s, 2008 and 2011, which were all above 5 percent annually. Accordingly, China's GDP growth immediately slumped in each of the high inflation years (National Bureau of Statistics of China, 2015). Hwang and Wu (2011) indicate that high inflation puts pressure on China's economic growth, social livelihood and trade performance.

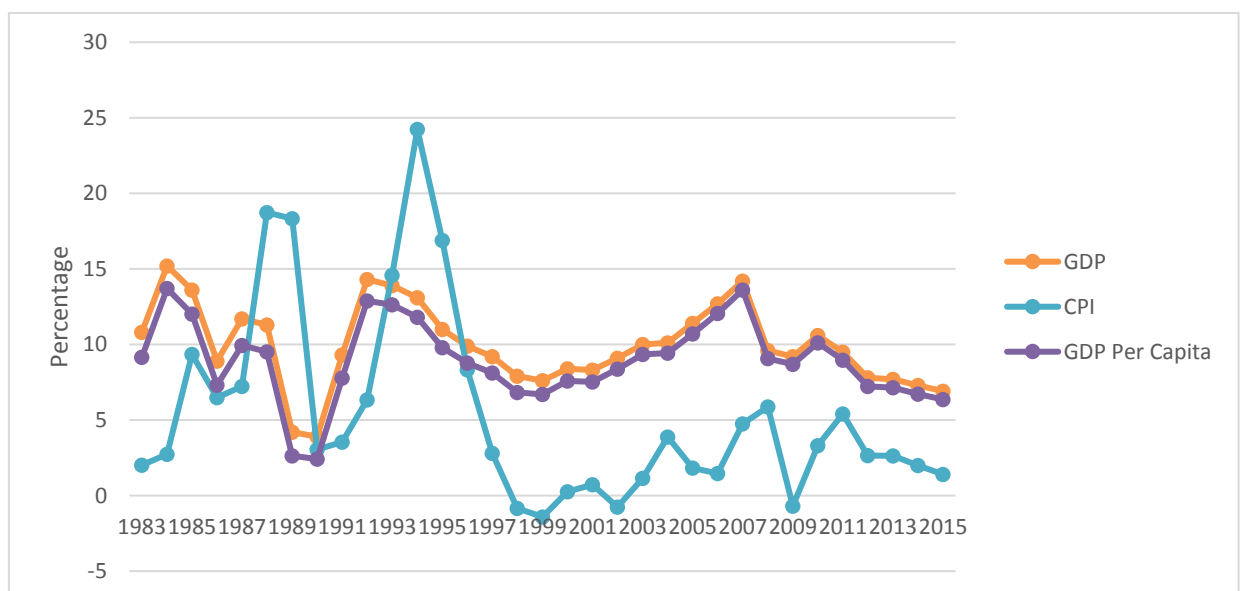


Figure 2-8 Growth in GDP, GDP Per Capita (annual %) and Inflation (%) in China (World Bank, 2016b)

Internet Diffusion

The Internet enables an immediate spread the new ideas and knowledge, which allows for an increasing diffusion of products and outcomes (Meijers, 2014). Economic growth benefits from the broad internet uses in many countries (Choi & Yi, 2009). In addition, Internet diffusion affects the market structure of a country, such as the labour market and the product market, which leads to the gains in efficiency obtained by doing business via the Internet (Meijers, 2006, 2014). Internet use is also deemed to have an impact on bilateral trade, as technological progress supports the refining and distribution of information and increases the tradability of services, which opens up increased possibilities for international trade in services (Popescu, 2007).

Internet diffusion is used as one of the important business environment indicators affecting the development of services trade in Gani and Clemes' (2013) study on the selected low, middle and high-income OECD countries. The authors argue that the extent of Internet diffusion is a measure of soft technology, which has an impact on the trade in service. The progress in technology drives sustained economic growth and promotes growth in the trade in services. Gani and Clemes (2013) also find evidence that Internet diffusion has a positive effect and is strongly correlated with services exports in the high-income OECD countries. The authors suggest that high levels of Internet diffusion contribute to higher levels of services exports. This result contrasts with the findings in Choi's (2010) study, who provide evidence that shows a significant but small effect of the Internet on trade in services using panel data for 151 developed and developing countries from 1990 and 2006.

Meijers (2014) uses panel data to examine the impact of Internet use on both economic growth and trade in the selected 162 developed and developing countries between 1990 and 2008. The findings in Meijers' (2014) study show that Internet use contributes to the general trade in the countries sampled. However, Meijers' (2014) empirical results highlight that Internet use has more impact on trade in non-high-income countries than in high income countries. This positive correlation between Internet use and international trade is consistent with the findings in studies by Vemuri and Siddiqi (2009) and Clarke (2008). Vemuri and Siddiqi (2009) report that the Internet positively enhances

international trade in the selected 64 developed and developing countries (including China) in the sample years 1985 to 2005. Moreover, Clarke (2008) investigates the relationships between Internet use and international trade in developed and in developing countries, and demonstrates that the effect of Internet use on trade in developing countries has a larger impact than in developed countries.

Feng (2015) notes that the Internet was firstly embraced by China in 1993. After two decades, China has had the world's largest number of Internet users each year since 2008. China Internet Network Information Center (CNNIC) (2015) reported that China had 649 million internet users by the end of 2014, which accounts for almost half of China's total population. The Internet penetration rate increased 2.1 percentage points to 47.9 percentage in the same year (see Figure 2.9) (China Internet Network Information Center, 2015). However, Li and Shiu (2012) indicate that Internet diffusion increased significantly in the eastern regions of China, and that the central and western regions are experiencing rising Internet diffusion.

Kumar, Stauvermann and Samitas (2016) illustrate that the Internet has a significant positive impact on China's GDP growth in the long run. The authors review the relationship between Internet growth and economic growth, and conclude that Internet has become a key factor for economic development in mainland China. However, Yi and Li (2011) note that few studies focus on the Internet in terms of its growth and political and economic applications in less developed countries or regions, including China.

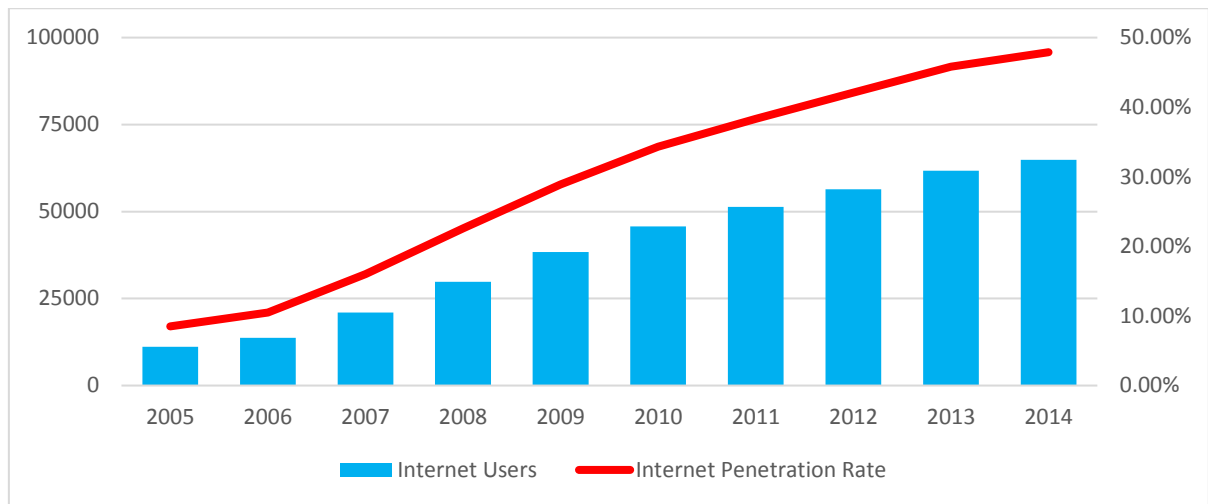


Figure 2-9 The number of Internet Users (in ten thousand) and Internet Penetration Rate (in percentage) in China between 2005 and 2014 (China Internet Network Information Center, 2015)

2.8 Trade Control Variables

2.8.1 Real Exchange Rate

Auboin and Ruta (2013) identify the real exchange rate as an important indicator of international price competitiveness, as it reflects the changes in costs, a country's productivity, and the relative prices of a country's international trade in goods and services in the global markets. Gani and Clemes (2013) argue that an increase in a country's real exchange rate indicates that the price of goods and services in that country will become more expensive compared to its competitors. In this scenario, the domestic demand for imports becomes higher and this results in an increase net imports to the country. Similarly, if a fall in a country's real exchange rate results in lower prices for its domestic goods and services, then its net exports become more competitive in the international markets (Gani & Clemes, 2013). Pattichis (2012) also summarize that a real depreciation of a country's domestic currency lowers the relative price of the goods and services it produces. Thus, as the exports of goods and services increase, and the imports of goods and services fall.

Previous empirical research has used the real effective exchange rate as an important trade control variable to measure the growth of international trade. Several scholars have focused on the effects of the real exchange rate on trade performance (see Cheung, Chinn, & Qian, 2016; Georgiadis & Gräb,

2016). However, academic research on the effects of the real exchange rate on the trade in services is sparse (Pattichis, 2012). The following section discusses the relationship between the real effective exchange rate and trade in services.

The Real Exchange Rate and Trade in Services

Thomas (2016) uses the real effective exchange rate as the measure of the relative prices of India's trade in services. The author adopts the empirical framework proposed by Houthakker and Magee (1969) to examine the impact of income and price elasticities on India's trade in services. Thomas (2016) points out two main reasons that the real effective exchange rate is used as the measurement of relative prices for India's services exports and imports. Firstly, the data on price indices are only for India's exports and imports of goods. As of 2016, there was no time series data on price indices of India's services exports and imports. Secondly, Thomas (2016) explains that serious conceptual problems are involved in measuring the prices of services. Hence, the author uses the real effective exchange rate index as the measure of relative prices of India's services exports and imports.

Thomas (2016) finds that the real effective exchange rate has a positive and statistically significant impact on India's services imports. The author's findings indicated that the increase in the real effective exchange rate raises the level of India's services exports. The empirical results in Thomas's (2016) study also show that the real effective exchange rate had an insignificant impact on India's services exports. The results of the empirical analysis on the relationship between relative prices and service exports in India suggest that the price of India's services exports are not competitive in international markets (Thomas, 2016). Thomas (2016) proposes that one of the reasons that India's exports are not complete is a lack of highly skilled English-speaking labours in its services industries.

Gani and Clemes (2013) include the real exchange rate as one of the trade control variables in their study to examine its effect on the trade in services in the low, middle and high-income countries. Gani and Clemes (2013) use the real effective exchange rate as the measure of relative prices. The findings show that the real effective exchange rate has a negative but statistically insignificant effect on services exports in the high-income OECD countries, positive and significant in the middle-income countries,

and positive and significant in the low-income countries. Moreover, the real exchange rate has a positive and significant effect on the growth of services imports in the high-income OECD countries, positive but insignificant in the middle-income countries, and positive and significant in the low-income countries. Gani and Clemes (2013) suggest that there was weak evidence that currency depreciation of is beneficial for services exports in the selected high-income countries.

Eichengreen and Gupta (2012) also empirically test the effects of the real effective exchange rate on both services exports and merchandise exports in 66 selected countries (9 low-income countries, 15 low-middle income countries, 20 high-middle income countries, and 22 high income countries) between 1980 and 2009. The authors confirm that the real exchange rate is positive and significant for the growth in services exports in the 66 selected countries. The results in their study indicate that the real exchange rate had a stronger impact on the growth of services exports than on the growth of merchandise exports. The authors also note that there was a weaker differential effect of the real exchange rate on services exports in developed and developing countries. However, Eichengreen and Gupta (2012) stress that appropriate policies toward regulating the real exchange rate are more important for the developing countries, especially when they shift from merchandise exports to services exports.

The Real Exchange Rate and Trade in Services in China

China's real exchange rate has been controversially deemed to play an important role in promoting and creating opportunities for the development of China's overall trade in the international markets (Keidel, 2011). For example, Xu, Mao, and Tong (2016) find that real appreciation of China's currency has negative effects on China's exports prices and exports quantities. Hence, many countries' policy makers have urged China's government to appreciate its currency. However, Li, Ma, and Xu (2015) provide evidence showing the development of China's trade is not promoted by the changes in its real exchange rate. Moreover, Li et al., (2015) demonstrate that China's exchange rate has insignificant effect on the prices of China's exports.

Figure 2.10 and Figure 2.11 present China's nominal exchange rate and its trade deficit in services, respectively. Figure 2.10 shows China's nominal devaluation from 4.78 to 8.28 Yuan per dollar between 1990 and 1999 (National Bureau of Statistics of China, 2015). In the 2000s, the nominal Yuan against the US dollar experienced an appreciation from 8.19 in 2005 to 6.83 in 2009 (National Bureau of Statistics of China, 2015). Between 2010 and 2014, the Yuan was steady against the US dollar but did devalue slightly from 6.77 to 6.14 at the end of 2014 (National Bureau of Statistics of China, 2015). In addition, Figure 2 shows that China's real effective exchange rate experienced a noticeable appreciation from 1983 to 1994 (National Bureau of Statistics of China, 2015). Since 1995, China's real effective exchange rate has fluctuated (National Bureau of Statistics of China, 2015). Figure 2.11 shows that over the three decades, the volume of China's trade deficit in services expanded to US\$1599 million in 2014.

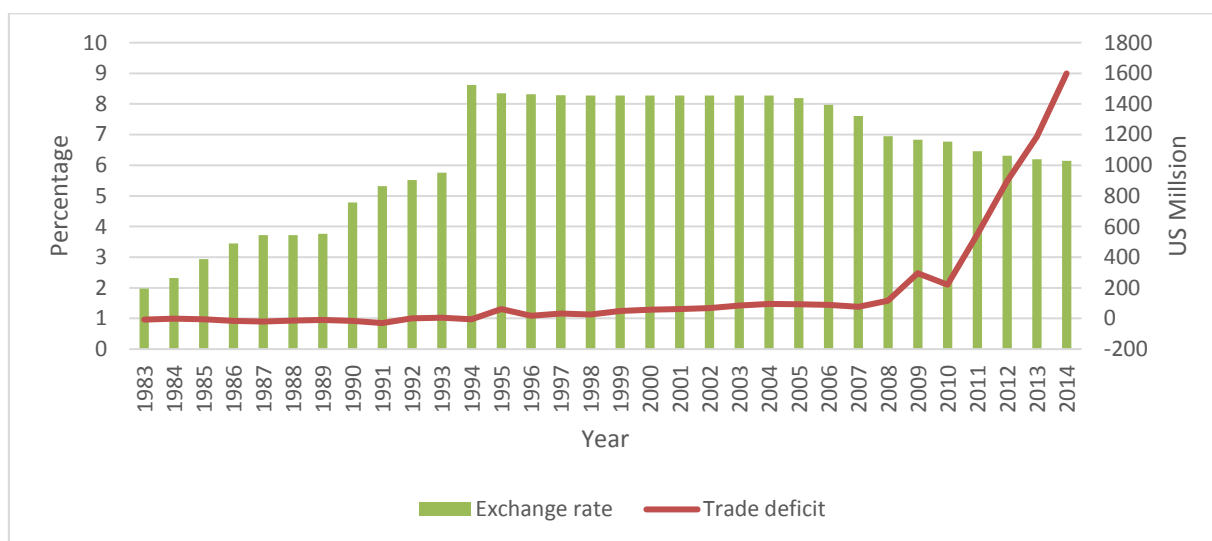


Figure 2-10 China's nominal exchange rate and trade deficit in services between 1980 and 2014 (National Bureau of Statistics of China, 2015)

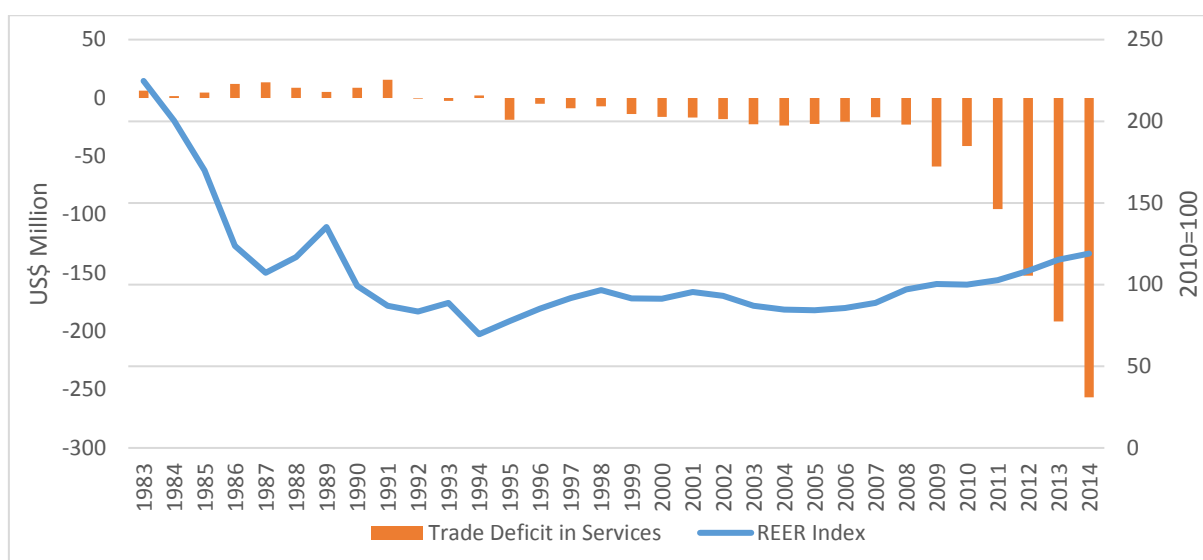


Figure 2-11 China's real effective exchange rate index (REER) (2010=100) and trade deficit in services between 1983 and 2014 (National Bureau of Statistics of China, 2015)

García-Herrero and Koivu (2009) summarized that there were two main findings on the effects of China's real exchange appreciation on its trade development. First, many findings revealed that an appreciation in China's real exchange rate reduced the trade balance (Xu et al., 2016). Secondly, the real exchange appreciation had no significant impact on the trade balance (Li et al., 2015). However, there is a lack of published research that has analysed the effects of China's real effective exchange rate on its trade in services.

2.8.2 World Income and Domestic Income

Thirlwall (1999) has suggested that a country's export growth depends on the world's income, and a country's growth of imports depends on its domestic income. Gani and Clemes (2013) note that a growing world economy may increase demand and drive a stronger purchasing power for a country's goods and services, which are likely to increase the volume of its exports. Gani and Clemes (2013) also demonstrate that a rise in the domestic economy may encourage individuals to participate in the creation and transition of goods and services, which may increase investment, production, and sales. These factors, when combined, may stimulate the importation of goods and services.

Many researchers have investigated and examined the effects of world income and domestic income on the growth of exports and imports in different countries and regions (see Constantinescu, Mattoo,

& Ruta, 2016; Gupta, Raychaudhuri, & Haldar, 2015; Rao & Mahale, 2011). The growth rate of world gross domestic product (GDP) and the growth rate of domestic GDP are often used as measures of world income and domestic income, respectively. For example, Abu-Lila (2014) finds that the world GDP growth rate and Jordan's GDP growth rate has a positive and statistically significant impact on Jordan's export growth and import growth. The authors also argue that a higher income elasticity of world income had the strongest impact on Jordan's export growth. However, when compared to the published empirical research on merchandise and overall trade, research on services trade and the impacting variables is limited.

The following section discusses the relationship between the world GDP growth rate and services exports, and the relationship between domestic income and services imports.

World Income, Domestic Income and Trade in Services

Thomas (2016) analyses the effects of income elasticities on India's trade in services from 1996-97 Quarter 1 to 2011-12 Quarter 4. The world GDP and India's domestic GDP are used to measure the effect of world income and domestic income on India's services exports and imports. The author notes that quarterly data on World GDP is not available. Therefore, the GDP of OECD countries is used as a proxy world GDP in their study. In terms of the relationship between the world GDP and services exports, Thomas (2016) reports that the variable of world GDP has a positive and statistically significant effect on India's services exports. This result indicates that an increase in world demand can increase the volume of Indian's services exports in terms of the relationship between the domestic GDP and services imports. The author also notes that India's domestic GDP growth had a positive and statistically significant impact on its services imports. Thomas's (2016) empirical result implies that an increase in India's domestic demand leads to an increase in the demand for India's services imports.

In addition, the empirical results on the positive and statistically significant relationship between income elasticities and India's trade in services suggest that in the long run, the income elasticity of demand for services exports is found to be significantly higher than the income elasticity of services

imports (Thomas, 2016). The author concludes that the balance of India's trade in services will be in surplus in the long run.

Rao and Mahale (2011) use the trade variables of India's GDP and the OECD countries' GDP to investigate the determinants of India's software exports. Software exports have been identified as the engine of growth for India's trade in services (Rao & Mahale, 2011). The authors prove that India's domestic GDP has positive but insignificant effect on its growth of services exports. Rao and Mahale (2011) also point out that the OECD countries' GDP has a positive and statistically significant impact on India's services exports.

Gani and Clemes (2013) investigate the effects of world income and domestic income on services exports and imports. The authors use the world's GDP growth rate as a measure of world income in their estimation of the impact of services exports in the selected low, middle and high-income countries. The authors indicate that the changes in services exports are determined by the development of the global economy. The results for world income in the authors' study show that the growth of world income has positive effects in all three income levels countries. The world income variable is statistically significant at the 10 percent level in the high-income countries, and at the 1 percent level in the middle-income category of countries (Gani & Clemes, 2013). The empirical results indicate that an increase in the growth of world income contributes strongly to the growth of services exports in the middle and high-income countries (Gani & Clemes, 2013).

In addition, Gani and Clemes (2013) demonstrate the domestic GDP growth rate as the measure of domestic income in their examination of services imports in the selected low, middle and high-income countries. The authors emphasise that a sufficient level of domestic productivity can encourage imports. The findings in Gani and Clemes' (2013) study show that the domestic income was statistically significant and positive for services imports in all three income categories of countries. The implication of Gani and Clemes' (2013) empirical results is that the growth of services imports benefited from the increase in domestic income in the selected countries.

World Income, Domestic Income and China's Trade in Services

Figure 2.12 and Figure 2.13 show an overview of the growth trend in China's services exports and the changes in the world's gross domestic product (GDP) growth rate, and the growth trend of China's services imports and China's domestic GDP growth rate, respectively. Figure 2.12 shows that the growth of world GDP (the blue bars) fluctuated between 1983 and 2014 (World Bank, 2016b). China's services exports (the yellow line) increased remarkably from only US\$25 million in 1983 to US\$2222 million in 2014 (National Bureau of Statistics of China, 2015; World Bank, 2016b). However, the volume of China's services exports had a notable decline in 2009, which corresponded to a significant drop in the world GDP growth rate in the same year (World Bank, 2016b). In addition, Figure 2.13 shows that China's GDP growth (the orange bars) fluctuated from 1983 and 2014 (World Bank, 2016b). China's services imports increased from US\$19 million in 1983 to US\$3821 million in 2014 (National Bureau of Statistics of China, 2015). Although China's GDP growth rate has slowed since 2010, China's services imports (the green line) increased rapidly (National Bureau of Statistics of China, 2015).

Published empirical research on income elasticity and China's trade has focused on China's goods exports and imports. For example, Yao, Tian and Su (2013) estimate the effects of foreign income elasticity on China's goods exports. The trade variable of foreign income is used as a measure of income elasticity on the growth of China's goods exports in their study. The authors find that the increase in foreign income has a positive impact on the value of China's exported goods. The empirical results show a relatively high income elasticity in Yao et al's., (2013) study indicating that the growth of China's exports is heavily reliance on its foreign income. However, there is a lack of published empirical research that examines the impact of domestic and world income on China's trade in services.

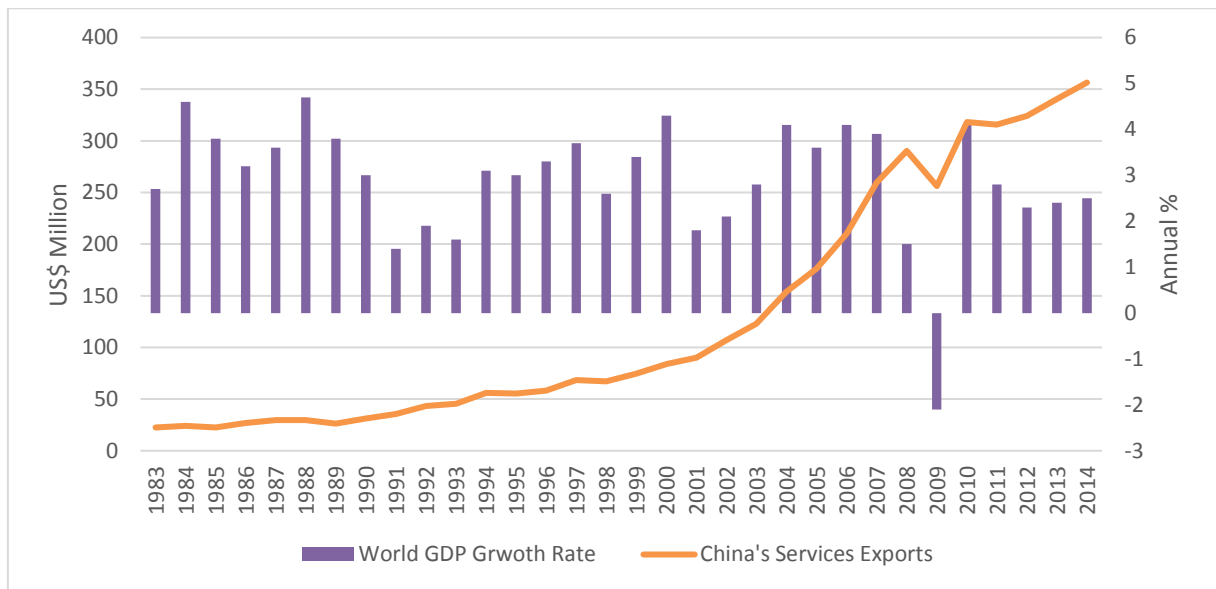


Figure 2-12 World's GDP growth rate and China's service exports between 1980 and 2014 (annual percentage changes) (World Bank, 2016b)

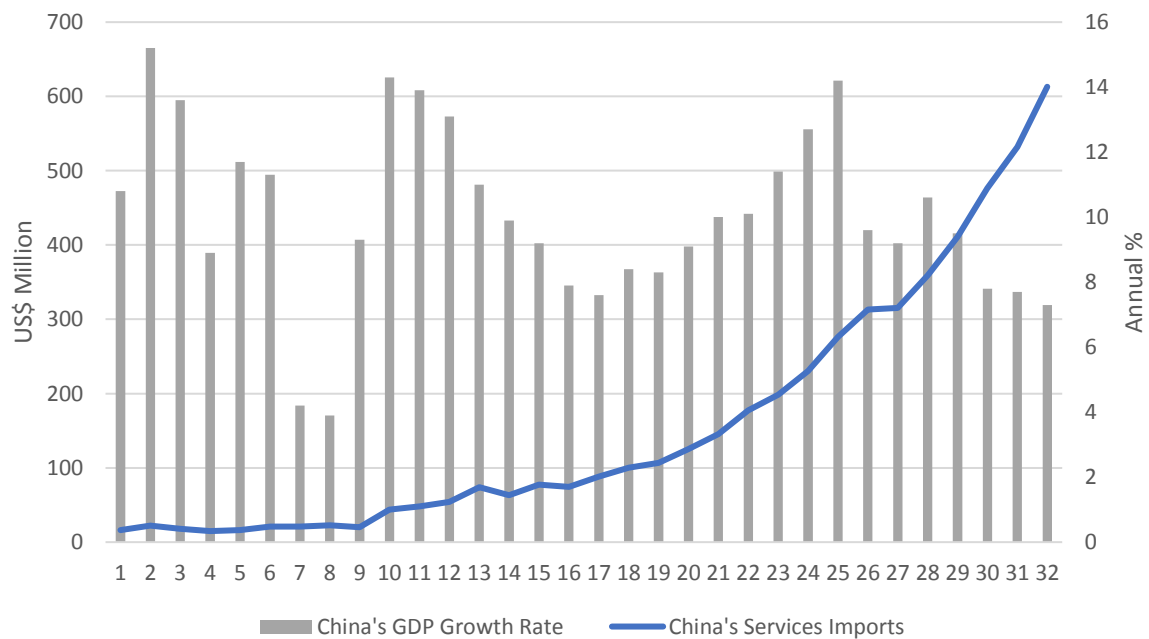


Figure 2-13 China's GDP growth rate (annually percentage change) and the volume of services imports (US Million) between 1985 and 2014 (World Bank, 2016b)

2.9 Chapter Summary

This chapter overviewed the extant literature examine the domestic business environment, the indicators of the domestic business environment, the trade in services and China's trade in services. Therefore, the relationships among the trade in services and the indicators developed for the empirical

analysis in this current study on China's domestic business environment are: FDI, employment in the services sector, tertiary education, inflation and Internet diffusion, are discussed in detail. The relationships between the trade control variables (the real effective exchange rate, world income, and domestic income) were also discussed.

Chapter 3

Research Method

3.1 Chapter Introduction

This chapter presents the research method in terms of the construction of the data sets and the econometric modelling methods used to test the research questions and subsequently, satisfy the research objectives. Section 3.2 discusses the data construction and data collection techniques. Section 3.3 and 3.4 discuss the research questions development and the development of the conceptual research model, respectively.

3.2 Data Construction

3.2.1 Data Collection Background

The World Bank project (Doing Business) was the main data source for the domestic business environment indicators used in the extant published empirical research (see Gani & Al-Abri, 2013; Gani & Clemes, 2013; Maxwell, 2012). Since 2004, the World Bank Group has documented the regulation of business and collected primary data on business regulations that may affect firms throughout their life cycle in 189 economies (World Bank, 2015a). Twelve years' annual reports of Doing Business have been completed and published by the World Bank Group from 2004 to 2015. Figure 3.1 shows the process of data collection and verification used by the World Bank (World Bank, 2015a). The questionnaires are distributed in one selected city ranging in countries from Afghanistan to Zimbabwe, including one city in China. The completed questionnaires are collected from expert respondents, including private sector practitioners and government officials. Doing Business (2015a) collected quantitative indicators that included 11 areas in the life of a business: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, resolving insolvency, enforcing contracts, and labour market regulation (World Bank, 2015a). The indicator of labour market regulation is an additional

indicator included in the Doing Business reports since 2016. The World Bank Group used these 11 indicators to analyse the effectiveness of an economy's development.

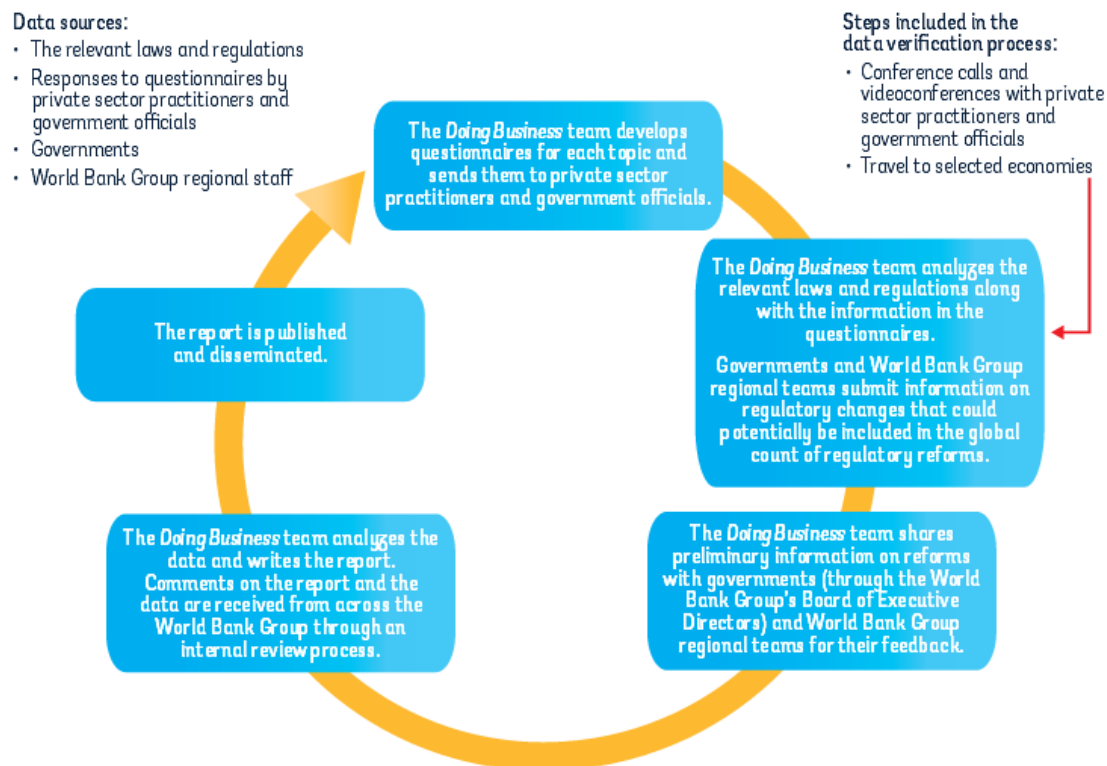


Figure 3-1 How Doing Business Collects and Verifies the Data (World Bank, 2015a)

In addition, the World Bank Group did conduct one project on a city by city basis in China in 2008. This subnational project covered thirty major cities and measured the effects of four indicators: starting a business; registering property; getting credit and enforcing contracts (World Bank, 2008).

The World Bank Group provides a thorough analysis on the effects of the selected indications on the domestic business environment. However, the current Doing Business indicators' data period is from 2004 to 2016. This time period is insufficient for the empirical time series regression estimation for China used in this research. Moreover, the existing subnational indicators at a city level for China were collected only in 2008. Thus, there is a lack of suitable research reports to use for comparative research focusing on the Chinese economy.

Eleven data bases were investigated in this current research (see Table 3.1). However, the data from these eleven databases does not provide the same, or even similar indicators, of the domestic business environment as used in the Doing Business survey.

Table 3-1 The list of the searched databases

NO	Database	NO	Database
1	National Bureau of Statistics of China	7	Federal Reserve Bank
2	United Nations Conference on Trade and Development (UNCTD)	8	Organization of Economic Co-operation Development (OECD)
3	World Trade Organization (WTO)	9	United Nations (UN)
4	International Monetary Fund (IMF)	10	Internet World Statistics
5	Economy Watch	11	Nation Master
6	Trading Economics		

Five of China's government departments were also considered as sources for the indicators. Business policies and regulation reports were searched from five main Chinese departments: Ministry of Commerce of the People's Republic of China; Ministry of Finance of the People's Republic of China; State Administration of Taxation; State Grid Corporation of China; and China Trade in Services. However, the databases from these five government departments do not provide a continuance data set that incorporate changes in the indicators.

Furthermore, publications were also searched from the Big Four Auditors Firms (Detoitt, Ernst & Young, KPMC and PwC) and the Top 10 Law Firms in Beijing and Shanghai. This current research revealed that the publications in the Big Four Auditors Firms concentrated on particular areas, such as banking and new energy. Moreover, the law firms lacked sufficient information on the general business environment in China that could be used in a longitudinal study such as the one used in this current research.

3.2.2 Building New Indicators of DBE in China

The lack of a suitable data set required the development of new indicators of the domestic business environment for China. Five measurable indicators in China were developed: foreign direct investment; the employment in service sector; tertiary education; inflation and internet diffusion. These five indicators are based on the literature review of the business environment and the international trade and services.

3.3 Research Questions

3.3.1 Research Question 1 Relating to Research Objective 1

The effects of the indicators on the domestic business environment have been empirically analysed in a few published studies (see Gani, 2011; Gani & Al-Abri, 2013; Zhang, Huang, et al., 2012). Specifically, Gani and Clemes (2013) examine the effects of six indicators of the domestic business environment on the trade in services by using firm-level data for the selected low, middle and high-income countries. The authors find that the different indicators have either positive or negative effects on the growth of the trade in services in the selected countries. Although China is included in the middle-income level countries, the results for China in Gani and Clemes's (2013) study are aggregated with the other middle-income countries. Further, to date, there is no concise set of national indicators of the domestic business environment that has been identified in a Chinese context. Therefore, a usable set of national level indicators of the domestic business environment is essential to empirically evaluate China's trade in services. Hence, the following research question is formulated:

RQ1: What are the potential national level testable indicators of the domestic business environment in the Chinese context?

3.3.2 Research Question 2 Relating to Research Objective 2

Santo-Paulino and Thirlwall (2004) indicate that the growth of exports and imports is impacted by several factors, including price elasticity, world income, domestic income, lagged export/import growth, trade liberalisation. In addition, Gani and Clemes (2013) further develop Santo-Paulino and

Thirlwall's (2004) conceptual research model by introducing the domestic business environment to investigate the effects of the potential indicators on the growth of trade in services in the selected countries. The findings in Gani and Clemes's (2013) study show that the expansion of the trade in services can also be impacted by the domestic business environment. However, empirical research on the effects of domestic business environment and the trade in services are sparse. Moreover, no published research has investigated the relationships between the domestic business environment and the trade in services for China. Therefore, the following research question is formulated:

RQ2: What are the effects of the indicators of the domestic business environment on China's trade in services?

3.3.3 Research Question 3 Relating to Research Objective 3

As noted in Chapter 2, the extant literature has identified five indicators of the domestic business environment (FDI, employment in the services sector, tertiary education, inflation, and internet diffusion). The effects of FDI varied between exports and imports in the earlier studies (Morrar & Gallouj, 2016; Tang et al., 2013). Inflation is also reported to have either a positive or negative effect on trade in studies by Mani and Mishra (2014), or Sehar et al., (2015). The effect of internet diffusion is reported to be positive on international trade in studies by Choi (2010), Gani and Clemes (2013) and Meijers (2014). In addition, the effects of level of employment in the service sector and tertiary education enrolment on the trade in services have not been investigated nor have the effects of the indicators of the domestic business environment on China's trade in services. Therefore, the following research question is formulated:

R3: How do the indicators of the domestic business environment influence on China's trade in services- positive or negative?

3.4 Conceptual Research Model Development

The structural research modelling used in this current research is based on the framework developed by Santos-Paulino and Thirlwall (2004), and Gani and Clemes (2013). The authors note that a country's

export performance is measured as the price of the country's exports relative to the foreign price of related goods expressed in a common currency. If the price elasticity and income elasticity of the demand for services are assumed constant, services exports can be expressed as:

$$EX_t = K(P_d/P_f)^{\lambda}_t WY^{\tau}_t \quad (1)$$

Where: EX is the level of exports; K is a constant; P_d/P_f is the relative domestic price and P_f is the foreign price measured in a common currency; WY is the level of world income; λ (<0) is the price elasticity of the demand for services exports; τ (>0) is the income elasticity of the demand for exports, and t is the time. In addition, Santos-Paulino and Thirlwall (2004) demonstrate that taking logs and differentiating with respect to time gives:

$$ex_t = \lambda(P_d - P_f)_t + \tau(wy_t) \quad (2)$$

Santos-Paulino and Thirlwall (2004), Santos-Paulino (2005), and Gani and Clemes (2013) note that Equation (2) is a basic structural model that can be used to analyse the responsiveness of service exports to changes in prices and income variations.

On the basis of Equation (2), Santos-Paulino and Thirlwall (2004) made three major modifications to formulate Equations (3), (4) and (5) shown below. The first adjustment is that the demand for exports to changes in prices and income is not instantaneous (Santos-Paulino & Thirlwall, 2004). Therefore, the modified specification of Equation (2) takes the form of:

$$ex_t = \alpha_0 + \alpha_1(pex)_t + \alpha_2wy_t + \alpha_3ex_{t-1} + \mu_t \quad (3)$$

Where: pex is the rate of change of relative prices; wy is the world income growth; ex_{t-1} is the lagged services export growth, and μ is the error term.

The second modification is that the effects of trade liberalisation, measured by the tariff rate (tl) and the cost of exports (ex -cost), are introduced in Equation (3) (Santos-Paulino & Thirlwall, 2004). Thus, the augmented estimating equation is:

$$ex_t = \alpha_0 + \alpha_1(pex)_t + \alpha_2wy_t + \alpha_3ex_{t-1} + \alpha_4tl_t + \alpha_5ex\text{-costs}_t + \mu_t \quad (4)$$

The third modification is based on Gani and Clemes (2013) estimation as the authors introduce the core variables of the domestic business environment into Equation (4). A set of indicators of the domestic business environment (DBE) is assumed to impact on trade in services. Therefore:

$$ex_t = \alpha_0 + \alpha_1(pex)_t + \alpha_2wy_t + \alpha_3 ex_{t-1} + \alpha_4tl_t + \alpha_5ex-costs_t + \Omega DBE_t + \mu_t \quad (5)$$

The DBE vector of variables in Equation (5) are: 1. the costs of doing business (cdb); 2. contract enforcement (ce); 3. the protection of property rights (pr); 4. dispute resolution (dr); 5. the extent of internet diffusion (int-d); 6. the strength of legal rights (lr). The expected signs on the variables in Equation (5) are: pex (-); wy (+); ext - 1 (+); tl (-); ex-costs (-); cdb; ce; pr and dr (-); int-d and lr (+).

Gani and Clemes (2013) emphasise that the effect of the domestic business environment on service imports is modelled by applying the same approach as discussed earlier for the export equation. The service imports growth equation is:

$$im_t = \alpha_0 + \alpha_1(pim)_t + \alpha_2dy_t + \alpha_3 im_{t-1} + \alpha_4tl_t + \alpha_5im-costs_t + \Phi DBE_t + \mu_t \quad (6)$$

Where: im is the growth rate of services imports, pim is the relative price change in imports, dy is the growth rate of domestic income, im_{t-1} is the lagged growth rate of services imports, tl is the trade liberalization, im-costs is the cost of imports, and the vector of DBE are the same variables as defined in Equation (5). The expected signs on the variables are: pim (-); dy (+); imt - 1 (+); tl (-); im-costs (-); cdb; ce; pr and dr (-); int-d and lr (+).

In summary, Equations (5) and (6) are finalized equations that Gani and Clemes (2013) used to analyse the effects of the domestic business environment on services trade. This current research uses the constructed data set discussed in Section 4.1 to estimate the model. The adjusted equations are:

$$ex_t = \alpha_0 + \alpha_1(pex)_t + \alpha_2wy_t + \alpha_3 ex_{t-1} + \alpha_4FDI_t + \Omega DBE_t + \mu_t \quad (7)$$

$$im_t = \beta_0 + \beta_1(pim)_t + \beta_2dy_t + \beta_3im_{t-1} + \beta_4FDI_t + \Phi DBE_t + \mu_t \quad (8)$$

Where: FDI is Foreign Direct Investment: the indicators of domestic business environment includes the employment rate in services, tertiary education, inflation, and internet diffusion.

3.4.1 Theoretical Justification of the Indicators of DBE

Foreign Direct Investment (FDI)

FDI refers foreign entrepreneurs who establish foreign-owned companies, co-operative enterprises, and joint ventures with Chinese investors to explore and develop resources and make financial investments in China (National Bureau of Statistics of China, 2015). Fernandes and Paunov (2012) illustrate that FDI could reduce the price of services, improve service quality, increase the variety of services available, and increase knowledge spillovers. The FDI data is summarized as nominal values in US dollars by NBSC (National Bureau of Statistics of China, 2015). Nominal values reflect current prices in order to place a value on the economy's production. However, nominal values do not provide a clear indication of FDI increases or decreases in the price level from one year to the next year. Therefore, this current research uses the GDP deflator to calculate the real values of FDI.

The GDP deflator and Consumer Price Index (CPI) are generally used in statistical analysis to measure real values (Gans, King, Stonecash, & Mankiw, 2012; Mankiw, 2013). In terms of a GDP deflator, Gans et al., (2012) note that a GDP deflator is the ratio of the current level of prices relative to the level of prices in the base year.

The Consumer Price Index (CPI) only measures the overall cost of a "basket of goods and services" to determine the price level for each year (Mankiw, 2013). However, researchers have pointed out that a CPI only compares the price of goods and services within a fixed basket (Gans et al., 2012; Mankiw, 2013).

The GDP deflator covers price changes related to a boarder range of variables, including government consumption, investment, and exports and imports of goods and services (Gans et al., 2012). McTaggart, Findlay and Parkin (2013, p. 434) note that the GDP deflator is a comprehensive measurement that is appropriate for macroeconomics. Therefore, the GDP deflator is used to calculate the real values in this research. The GDP deflator used in this current research and nominal FDI are collected from the National Bureau of Statistics of China. The calculation of the real FDI is:

$$Real\ FDI = \frac{Nominal\ FDI}{GDP\ deflator} \times 100$$

Employment in China's Services Sector

The number of people employed in the services sector is collected by the National Bureau of Statistics of China (National Bureau of Statistics of China, 2015). The annual changes of employment in the services sector is used as the proxy to measure the effect of employment in services on China's trade in services.

Tertiary Education

Tertiary education is considered as important human capital, which plays a direct role in production through the generation of worker skills and also an indirect role through the facilitation of technology innovation (He, 2015). This current research measures tertiary education as the annual change in the tertiary enrolment rate and the number of tertiary graduates in China. There is no published data identifying the number of educated people employed in the agricultural, manufacturing and services sectors. Therefore, this research uses the overall tertiary enrolment rates and the overall tertiary graduate rates as proxies for the effect of education on China's service exports and service imports, respectively.

Inflation

The rate of inflation reflects the macroeconomic situation, and it is considered as an important tool to change the trade capacity (Munir et al., 2009). The changes in the inflation lead to increase or decrease excessive price of business. The inflation reflects the increase in the average price of all goods and services (Taylor & Dalziel, 2002). This current research uses data on China's annual inflation derived from the World Bank database, which measures inflation using the annual percentage change in the consumer price index.

Internet Diffusion

The internet makes a significant contribution to the spread of knowledge and the generation of new information in the developed and developing countries (Choi & Yi, 2009). In particular, firms in developing countries benefit if they have Internet access to information that will help them find new

market opportunities. Internet diffusion also plays an important role in increasing the productivity of business performance (Meijers, 2014). Thus, internet diffusion is included as a measure of soft technology, which may influence China's trade in services. Internet diffusion is measured by the number of internet users (on a per 100 people basis) and these are people with access to the worldwide network via computers, mobile phones, and personal digital assistants.

3.4.2 Theoretical Justification of the Trade Control Variables

The Real Exchange Rate

The real exchange rate is included in Equations (7) and (8) for estimation of its effect on China's services exports and services imports. The real exchange rate as a trade control variable is used to reflect the international price competitiveness of China's trade in services. Gani and Clemes (2013) argue that if the real exchange rate depreciates and if the price of domestic goods and services falls then the price of competitors' goods and services rises. The implication of this scenario is that the domestic demand for imports tends to be lower and foreign demand for domestic goods and services tends to be higher. Similarly, if the real exchange rate appreciates, it leads to a reduction in China's overall trade surplus as it decreases exports and increases imports. The measure of the relative price in this current research is the real effective exchange rate index with 2010 as the base year.

World Income

The world income is included in Equation (7) as an important trade variable in the estimation of China's services exports, because the expansion of exports depends primarily on the level of the world economy. A growing world economy determines the purchasing power of China's services exports. Thus, the changes in world demand can affect the volume of service exports. Moreover, services exporters are expected to respond to increases in world demand by increasing their production of exports. The trade control variable of world income is measured by the world gross domestic product (GDP) growth rate (annual percentage).

Domestic Income

The domestic income is used in Equation (8) as a trade control variable to measure its effect on China's services imports. The expansion of imports is expected to depend on the level of the domestic income. The growth of the domestic income determines the price of China's imports. The domestic income trade variable is measured by the growth rate of China's gross domestic product (GDP).

3.4.3 Econometric Modelling

Unit Root Tests

The unit root test is used to determine whether a time series variable is stationary or non-stationary (Griffiths, Hill, & Lim, 2008, p. 336). As Granger and Newbold (1974) note that a significant regression relationship can be spurious if the variables involved are nonstationary. Thus, the non-stationarity of variables need to be addressed before a sensible modelling exercise can be carried out. Dickey and Fuller (1979, 1981) developed a formal procedure to examine the presence of a unit root. The Dickey-Fuller test is commonly applied to check whether a time series variable contain a unit root. In the Dickey-Fuller test, the null hypothesis is that the time series has a unit root against the alternative hypothesis that it is stationary (Enders, 2015; Maddala, 2001). In terms of Equation (7) and (8) in this current study, the stationarity of each variable needs to be determined by using the unit root test.

Cointegration

Engle and Granger (1987) were the first scholars to introduce the concept of cointegration. Enders (1995, p. 358) notes "cointegration refers to a linear combination of nonstationary variables". Wooldbridge (2013, p. 646) points out that when a linear combination in the nonstationary variables is stationary, these variables are cointegrated. A cointegration regression estimates the long-run equilibrium properties of time series variables in economic models (Enders, 1995; Gujarati & Porter, 2009). Theoretically, the number of cointegrating vectors is infinite. Therefore, the cointegrating vector is usually normalized by fixing its coefficient at unity (Enders, 1995). Moreover, all variables need to be tested ensuring they are integrated in the same order (Stock & Watson, 1988). Enders (1995) and Gujarati (2003) point out that if two integrated variables are different in order, then they

cannot be cointegrated. Thus, cointegration implies that the dependent variable and independent variables share similar stochastic trends (Baltagi, 2008; Stock & Watson, 1988).

The Engle-Granger test is one of the methods used to examine the stationarity of the residuals and identify cointegration (Granger, 1986; Kennedy, 2008). Hill, Griffiths and Lim (2011) report that if the residuals are stationary, then the dependent variable and independent variables are cointegrated. Wooldridge (2013, pp. 647-648) notes the benchmark of critical values for the cointegration test as shown in Table 4.2:

Table 3-2 Critical values for the cointegration test

Regression Model	1%	2.5%	5%	10%
1. $y = \beta_1 + \beta_2 x + e$	-3.90	-3.59	-3.34	-3.04
2. $y_t = \beta_1 + \delta_t + \beta_2 x_t + e_t$	-4.32	-4.03	-3.78	-3.50

Multiple Regression Analysis

Multiple regression analysis reveals the relationships between the variables of interest: the dependent variable and the explanatory variable(s) (Hill et al., 2011). Nieuwenhuis (2009) notes that the values of explanatory variable(s) are assumed to have positive or negative effects on the value of the single dependent variable.

In the Equation (7) and (8), the dependent variables are Service Exports and Service Imports. The explanatory variables are the Real Effective Exchange Rate, World Income, Domestic Income, FDI, Tertiary Education, Employment Rate, Inflation and Internet Diffusion. This current research examines the direct relationship between the two dependent variables (Services Export and Services Import) and the explanatory variables in the two equations, respectively. The coefficients of $\alpha_1 \dots \alpha_4$ and $\beta_1 \dots \beta_4$ are the intercept term, which measure the effects of one unit of change in the explanatory variable on

Service Exports and Service Imports in the two equations, respectively. The signs of $\alpha_1 \dots \alpha_4$ and $\beta_1 \dots \beta_4$ indicate positive or negative effects of the explanatory variables on Service Exports and Service Imports. In addition, the magnitude of $\alpha_1 \dots \alpha_4$ and $\beta_1 \dots \beta_4$ measure the amount of change in each explanatory variable. Further, the error term μ represents residuals between observed values and predicted values of Service Exports and Service Imports.

Coefficient of Determination

The coefficient of determination (R^2) measures the degree of usefulness of the estimated model (Hill et al., 2011). The R^2 is the proportion of the reduction of the variation of the dependent variable that is explained by all independent variables (Gujarati & Porter, 2009). The calculation of R^2 is as follows (Nieuwenhuis, 2009):

$$R^2 = \frac{SSR}{SST} = \frac{SST - SSE}{SST} = 1 - \frac{SSE}{SST}$$

Where: SSR stands for the sum of squares regression;

SST stands for the total sum of squares;

SSE stands for sum of the squared errors.

Nieuwenhuis (2009) lists the rules of R^2 :

$$0 \leq R^2 \leq 1$$

If the value of the R^2 is close to 0, then the reduction in variation is only a small proportion. This result implies that the regression model has a weak predictive ability. If the R^2 is close to 1, then the reduction in variation is a large proportion, which means the regression line perfectly fits the sample data. Therefore, the R^2 is considered as a measure of “goodness-of-fit”.

Based on these definitions, the measurements of SST, SSE and SSR for service exports and imports for the model in this study are as follows:

$$1. \quad SST_{ex} = \sum (EX - \overline{EX})^2 \text{ and}$$

$$SST_{im} = \sum (IM - \overline{IM})^2$$

Where \overline{EX} and \overline{IM} are the means of service exports and imports.

$$2. \text{SSE}_{\text{ex}} = \sum (\widehat{EX} - \overline{EX})^2 \text{ and}$$

$$\text{SSE}_{\text{im}} = \sum (\widehat{IM} - \overline{IM})^2$$

Where \widehat{EX} and \widehat{IM} are the predicted values for service exports and imports.

3. $\text{SSR}_{\text{ex}} = \sum (EX - \widehat{EX})^2$ and $(EX - \overline{EX})^2$ and $(IM - \overline{IM})^2$ are the total variations of the actual values of services exports and imports about their sample mean, respectively. $(\widehat{EX} - \overline{EX})^2$ and $(\widehat{IM} - \overline{IM})^2$ are the variation of the estimated service exports and imports, which are explained by the regression, respectively. The smaller $(\widehat{EX} - \overline{EX})^2$ and $(\widehat{IM} - \overline{IM})^2$ the more reliable the predictions obtained from the regression model. $(EX - \widehat{EX})^2$ and $(IM - \widehat{IM})^2$ are defined as a residual, which describes the difference between what actually occurred and what the model predicted would occur (Halcoussis, 2005).

In terms of the Equation (7) and (8), the R^2 represents the percentage of variation in the dependent variables (Service Exports and Service Imports) explained by the variation in the conducted explanatory variables. Higher values of a R^2 indicate that the model fits the data well (Hill et al., 2011). Therefore, the adjusting coefficient of determination can improve the model fit.

Test of Significance of the Regression Model

The F-test is the test statistic estimating the overall significance of the regression model. The value of the F-test statistic is calculated as follows (Hill et al., 2011):

$$F = \frac{(SST - SSE)/(K-1)}{SSE/(N-K)}$$

Where: SST is the total sum of squares;

SSE is the sum of squared least squares residuals;

K is the number of coefficients in the unrestricted model;

N is the number of observations.

Regarding to Equation (7) and (8), $SST_{ex} = \sum (EX - \overline{EX})^2$ and $SST_{im} = \sum (IM - \overline{IM})^2$, and $SSE_{ex} = \sum (\widehat{EX} - \overline{EX})^2$ and $SSE_{im} = \sum (\widehat{IM} - \overline{IM})^2$. K is 8 independent variables and N is 31 observations in each equation.

The null hypothesis for the F-test is that all the regression coefficients are equal to 0. Hill et al. (2011) conclude that when a regression model has no significant predictability for the dependent variable, the null hypothesis is accepted. Conversely, when at least one of the independent variables has significant predictability of the dependent variable, the null hypothesis is rejected.

Gujarati (2003) notes that the coefficient of determination R^2 and the F test have an intimate relationship when used in the analysis of variance, which is presented as follows:

1. When $R^2 = 0$, F = zero;
2. The larger the R^2 , the greater the F value;
3. When $R^2 = 1$, F is infinite.

Therefore, the F test is both a measurement of overall significance of the estimated regression and a test of significance of the R^2 . The F-test can test the joint null hypotheses for the three hypotheses formulated for this study. If the null hypothesis is true, there is no significant independent variables in the model. Thus, the independent variables cannot explain the dependent variables (Service Exports and Service Imports). Therefore, the constructed variables need to be modified and developed. Whereas, if the null hypothesis is rejected, the constructed variables are valuable in explaining the two dependent variables.

3.4.4 Assumptions for Regression Analysis

Outliers

Outliers are data points which deviate significantly from the remaining data set (Aggarwal, 2013). An outlier is an abnormally large or abnormally small value in a data set, and may have considerable

impact on the regression solution (Nieuwenhuis, 2009). Maddala (2001) suggests that outliers should be deducted or modified to reduce their disproportionate influences on the research model. Residual scatterplots or statistical methods such as Mahalanobis distance can be used to identify multivariate outliers (Maddala, 2001). The outliers lie outside the general linear pattern of the regression line (Hill et al., 2011). As a rule of thumb, an outlier is the observation whose standard residual is 2.5 or greater for 80 or fewer observations (Hair, Black, Babin, & Anderson, 2010). However, the detection of outliers from the data set must be done carefully as their deletion may generate further outlying cases (Aggarwal, 2013).

Multicollinearity

Multicollinearity denotes the high correlation relationships among some, or all explanatory variables, when two or more independent variables are strongly collinear (Hair et al., 2010). Dorak (2007) notes that collinearity may impact on the estimation and explanation of the relationships between the predictors and the dependent variable in the model.

Halcoussis (2005) notes that any regression with more than one independent variable may at least have some multicollinearity, thus, there is no real test to identify multicollinearity. Multicollinearity can be detected by testing the correlation matrix for independent variables, which is the matrix of the correlation coefficients of all pairs of independent variables (Nieuwenhuis, 2009). Maddala (2001) suggests that if the correlation coefficient of any pair of independent variables is close to 1, or close to -1, there may be collinearity problems. In addition, a regression model that has a high value of R^2 and a statistically significant F test with insignificant t-tests of coefficients indicates the present of substantive effects of multicollinearity (Asteriou & Hall, 2007).

In this study, multicollinearity is tested and eliminated before the estimation of multiple regression in the model. Each pair of the constructed independent variables were tested in the correlation matrix to identify any potential high correlations between them. For example, during the data construction process, trade growth, per capita GDP growth and government spending were pre-selected as the independent variables. However, these three variables were tested and were highly correlated with

two or more variables in the model (e.g. per capita GDP was tested and proved to highly correlated with employment in services and tertiary enrolment at 95.2% and 96.7%, respectively). Therefore, these three variables were dropped from the model.

The importance of removing these highly correlated variables avoids negative consequence to either the model or the regression results (Halcoussis, 2005). Gujarati (2003) illustrates that if independent variables exhibit multicollinearity it indicates that they contain similar information. This may cause the sign of the estimated independent variables to be opposite. Therefore, as the regression results will be biased, the dependent variables (services exports and imports) cannot be accurately explained by this regression results.

Linearity

The linear relationships are examined between the dependent variable and independent variables, as linearity indicates an accurate description of the true relationship among the variables (Gujarati & Porter, 2009). Hair et al., (2010) stress that if a nonlinear relationship occurs in a model, it can cause an underestimation of a relationship and limit the generalizability of the results. Therefore, the assumption of linearity is considered a vital issue that must be addressed in regression analysis (Hair et al., 2010).

Examining the residual scatterplots is a general graphical method to identify any nonlinear patterns in the data (Hair, Black, Babin, Anderson, & Tatham, 2006). Field (2009) notes that residual scatterplots should be randomly circulated around the horizontal axis. The presence of any curves in the graph indicate the potential violation of the linearity assumption (Field, 2009).

Error Term Normality

The assumption of normality is that the pattern of the data is distributed randomly and normally with a mean value of 0 (Hair et al., 2010). Hair (2006) suggests that researchers should ensure that the observed data are distributed within the acceptable range.

Maddala (2001) recommends the Histogram and the Jarque-Bare (JB) Test as adequate methods to examine the normality of residuals. The histogram is an observation that compares the distribution sample data values with the normal distribution (Hair et al., 2010). Gujarati (2003) notes that the shape of pattern is the bell-shaped normal distribution curve on the histogram.

In addition, the Jarque-Bare test includes measuring skewness and kurtosis, which are two measurements for normality (Hill et al., 2011). The calculation of the JB test statistic is as follows:

$$JB = \frac{N}{6} \left(S^2 + \frac{(k-3)^2}{4} \right)$$

Where: N is the sample size;

S is skewness;

K is kurtosis.

Hill et al. (2011) note that if the value of the JB test is larger or equal to the critical value 5.99, the null hypothesis is rejected. The results of normality tests can provide an indication for researchers to improve their models and discover suitable data points. Therefore, the histogram and the Jarque-Bare (JB) Test can confirm the adequacy of the model and the constructed variables in this study.

Error Term Independence

The error term independence assumption means that each observation should be independent in multiple regression (Hill et al., 2011). Hair et al. (2006) stress that the patterns that appear in a residual plot should be randomly and similar to the null plots of residuals. Maddala (2001) suggests that autocorrelations results in an unbiased but inefficient estimation of variables in the analysis, as well as overestimated F and t statistics. Autocorrelation in the errors indicates that the model still has room to be improved. Moreover, the presence of extreme autocorrelation is often a symptom of a serious mis-specified model (Maddala, 2001).

The Durbin-Watson test is the common method for diagnosing the dependence of the error term (Asteriou & Hall, 2007). The Durbin-Watson test procedure is as follows:

$$d = \frac{\sum_{t=2}^T (e_t - e_{t-1})^2}{\sum_{t=1}^T e_t^2},$$

Where: e_t is the least squares residual.

Nieuwenhuis (2009) notes that there are five rules of understanding the Durbin-Watson test as follows:

The value of d ranges only from 0 to 4;

When a D statistic value closes to 0, which indicates first-order autocorrelation is positive;

When a D statistic value closes to 4, which indicates first-order autocorrelation is negative;

If D statistic is closer to 0, the positive first-order autocorrelation is stronger. If D statistic closes to 4, the negative first-order autocorrelation is stronger.

When a D statistic value closes to 2, which indicates no first-order autocorrelation.

Upper and lower critical values d_u and d_L , have been tabulated for different values of k (the number of explanatory variables) and n (sample size) (Ryan, Montgomery, & Peck, 2014). The decision rules for the Durbin-Watson test are (Hill et al., 2011):

If $d < d_L$, reject the null hypothesis;

If $d > d_u$, accept the null hypothesis;

If $d_L < d < d_u$, the test is inclusive.

Error Ter Homoscedasticity

Homoscedasticity refers to the assumption that the dependent variables exhibit constant variance of error terms across the range of values for independent variables (Hill et al., 2011). Conversely, if the variances for all observations are unequal, heteroscedasticity is present (Hill et al., 2011). Maddala (2001) suggests the variables in each experimental condition should not be similar, because heteroscedasticity can result in two consequences. Firstly, heteroscedasticity can lead to unbiased but reduced effectiveness in identifying statistical relationships of observations; secondly, estimation of

the variances can be biased (Nieuwenhuis, 2009). However, data transformations may resolve heteroscedasticity (Hair et al., 2010).

In terms of detecting heteroscedasticity, Asteriou and Hall (2007) recommend using appropriate tests, including the Breusch-Pagan LM test, the Glesjer LM test, the Harvey-Godfrey LM test, the Park LM test, the Goldfeld-Quadt test, and the White's test. If the p-value of the Chi-Square statistic is less than the level of significance α , usually $\alpha = 0.05$, the null hypothesis is rejected (Asteriou & Hall, 2007).

Therefore, detecting homoscedasticity means that service exports and imports exhibit similar amounts of variance across all values of the independent variables in this study.

Ramsey RESET Test

The RESET (REgression Equation Specification Error Test) is a diagnostic test developed by James B. Ramsey for detecting omitted variables and identifying incorrect specified models (Hill et al., 2011; Ramsey, 1969). Equation (7) is used to discuss the process of RESET, which is as follows (Hill et al., 2011):

In order to perform the RESET test on Equation (7), the prediction variable ex is obtained. The estimation of RESET is one or both of the following equations:

$$ex = b_1 + b_2(pex)_2 + b_3wy_3 + b_4wy_4 + b_5FDI_5 + \Omega DBE_t + \gamma_1 (ex)^2 + \mu_t \quad (9)$$

$$ex = b_1 + b_2(pex)_2 + b_3wy_3 + b_4wy_4 + b_5FDI_5 + \Omega DBE_t + \gamma_1 (ex)^2 + \gamma_2 (ex)^3 + \mu_t \quad (10)$$

The hypotheses of interest are (Hill et al., 2011):

In equation (9), a test for misspecification is: $H_0: \gamma_1 = 0$ against $H_1: \gamma_1 \neq 0$. A t-statistic and p-value can be obtained from the least squares estimation output. Rejection of the null hypothesis means that the original model has detected misspecification(s), which can be improved.

In equation (10), a test for misspecification is: $H_0: \gamma_1 = \gamma_2 = 0$ against $H_1: \gamma_1 \neq 0$ and/ or $\gamma_2 \neq 0$. Hill et al., (2011) notes that an F-distribution is required. Rejection of the null hypothesis implies some general model misspecification in the original regression model.

This current research also use the RESET test to detect possible misspecifications of the functional form of the conceptual research model. In addition, this test confirms that the constructed data contains significant independent variables for the service exports and imports.

3.5 Chapter Summary

This chapter outlines the research method, and the research questions development. The data construction, the method of data collection and the statistical techniques used in this current research are discussed.

Chapter 4

Data Analysis and Empirical Results

4.1 Chapter Introduction

This chapter presents the regression results of the data analysis. The results of statistical assumptions of regression analysis, and multiple regression are examined and discussed. The research questions are also tested. The results of the regression analysis are also discussed.

4.2 Assumptions for Regression Analysis

4.2.1 Unit Root Test

The Unit Root testing was performed for the variables to determine if they were stationary in the model in accordance with the Augmented Dickey-Fuller (ADF) test. The null hypothesis of the unit root test is that the variable under investigation has a unit root (Enders, 2015). If the p-value of the ADF statistic for the associated variable is greater than 5%, the null hypothesis is not rejected, which indicates that the variable is nonstationary (Griffiths et al., 2008). The results of the ADF test show that the p-values of all the variables are less than 5% (See Appendix B.1). Therefore, the null hypothesis for each variable is rejected as all variables are stationary in this study.

4.2.2 Outliers

The two models were examined to ensure that outliers were not present. Hair (2010) note that for a small sample size of 80 or less, outliers are the outlying observations whose standardised residual is 2.5 or greater. Maddala (2001) suggests that outliers should be excluded from the analysis in order to reduce their influence on the performance of the regression models. The results presented in the tables in Appendix B2 show that the residuals of each variable in Equation (7) are generally less than 0.3 and the residuals of each variable in Equation (8) are generally less than 0.8. Therefore, there are no outliers in the two models.

4.2.3 Multicollinearity

The two regression equations were evaluated for the degree of multicollinearity (see Appendix B.3). The correlation coefficient between any pair of the independent variables is small, generally less than 0.4. In addition, the values of R^2 for each regression model are not excessively high. While the F-values for the two regression models are significant at the 1% level, most of the t-values are also significant. Thus, six of the independent variables (Lagged Services Exports, the Real Effective Exchange Rate, World GDP Growth Rate, FDI, Tertiary Education Graduate, and Inflation) are significant and two are not significant (Employment in the Services Sector and Internet Diffusion) in Equation (7). Six of the independent variables (Lagged Services Imports, the Real Effective Exchange Rate, FDI, Tertiary Education Enrolment, Inflation and Internet Diffusion) are significant and two are not significant (Domestic GDP Growth Rate and Employment in Services Sector) in Equation (8).

4.2.4 Linearity

The scatter plots of the standardised residuals versus the standardised predicted values of the dependent variables for the two regression models were analysed in a visual examination to detect any systematic pattern. The scatter plots of the residuals are randomly distributed (see Appendix B.4). In addition, the residual graphs reveal that the residual plots unsymmetrically fluctuate around the horizontal line for the two regression models. Therefore, the pattern indicates that the assumption of the specified linear relationship is valid (Hair et al., 2010).

4.2.5 Error Term Normality

The histogram residual diagram and the Jarque-Bera (JB) test were used to assess the assumption of normality. The histogram graphs show the shape of the residuals in the two regression models and indicate that they are distributed similarly to the normal distribution pattern (See Appendix B5). In addition, the values of the Jarque-Bera statistic are 2.372 and 0.3107 for the two regression models, respectively. These results indicate that the JB values of the two models are less than the critical value

5.99. Moreover, the p-values are 0.3054 and 0.8561, which are greater than 0.05. Thus, the evidence supports that the assumption of normality has been met (Hill et al., 2011).

4.2.6 Error Term Independence

The Durbin-Watson (DW) test was used to determine the assumption of independent errors. The statistic results of the DW test are summarized as follows:

Table 4-1 Durbin-Watson test statistics

Equation	Dependent Variable	Durbin-Watson Statistic	Critical Value (at 5% level)		Critical Value (at 1% level)	
			D _L	D _U	D _L	D _U
7	Services Exports	2.318	0.879	2.120	0.710	1.906
8	Services Imports	1.826	0.879	2.120	0.710	1.906

Notes: n = 31, k = 8

Table 4.1 shows that the results of the Durbin-Watson test for the two models are greater than the D_U at each critical value level. The results indicate that there is no first-order autocorrelation in the residuals. Therefore, the assumption of the independence of the error terms was satisfied in the two models (Maddala, 2001).

4.2.7 Error Term Homoscedasticity

The Breusch-Pagan LM test, which has a limiting Chi-square distribution, was used to test for the assumption of homoscedastic error for the two regression models. The test results show that the probability values of the chi-square statistics were 0.1712 and 0.0526 (Tables 4.2 and 4.3) for the two models, respectively. The chi-square p-values are greater than the significance level of 0.05, thus, the assumption of homoscedasticity was satisfied (Asteriou & Hall, 2007).

Table 4-2 The Brusch-Pagan LM test results for Regression Equation (7)

F-statistic	1.6369	Prob. F(8,21)	0.1712
Obs*R-squared	11.5670	Prob. Chi-Square(8)	0.1716
Scaled explained SS	5.4644	Prob. Chi-Square(8)	0.7070

Table 4-3 The Brusch-Pagan LM test results for Regression Equation (8)

F-statistic	2.3647	Prob. F(8,21)	0.0526
Obs*R-squared	14.332	Prob. Chi-Square(8)	0.0735
Scaled explained SS	7.6249	Prob. Chi-Square(8)	0.4709

4.2.8 Ramsey RESET Test

Ramsey's Regression Specification Error Test (RESET) was used to test the model misspecification and detect omitted variables and incorrect functional forms (Hill et al., 2011). The statistical results of RESET are summarised in Appendix B.7.

The two tables show that p-values are 0.5041 and 0.0314 for the two models, respectively. The p-value of the RESET test for Equation (7) is greater than 0.05, which indicates that the null hypothesis of no misspecification is not rejected at the 5% significance level. The p-value of RESET for Equation (8) is greater than 0.01. Therefore, the results show that the functional forms of the Equation (7) is adequate. However, the p-value of RESET for Equation (8) indicates that the specification of Equation (8) could be improved.

The regression results of the two models are reported in the following sections.

4.3 Results Pertaining to the Research Objectives

4.3.1 Results Pertaining to Research Objective 1 and Research Objective 3

The first regression model used Services Exports as the dependent variable. The three independent variables are Lagged Services Exports (EX [-1]), Real Effective Exchange Rate Index (PEX) and World GDP Growth Rate (WY). The five indicators of the domestic business environment are Foreign Direct

Investment (FDI), Employment in Services Sector (EMP), Tertiary Education Graduates (EDU_G), Inflation (INF) and Internet Diffusion (INT_D). The results of the analysis are presented in Table 4.4.

Table 4-4 Regression results relating to Equation (7)

Variables	Coefficient	Std.Error	t-Statistic
EX(-1)	-0.3459**	0.1402	-2.4671
PEX	-0.0025*	0.0006	-4.4130
WY	0.0417*	0.0112	3.7084
FDI	0.1728*	0.0481	3.5943
EDU_G	0.0033**	0.0012	2.7298
EMP	0.0048	0.0036	1.3514
INF	-0.0497*	0.0158	-3.1494
INT_D	0.0011	0.0009	1.2904

Note: *statistically significant at the 1 percent level of significance

**statistically significant at the 5 percent of significance

***statistically significant at the 10 percent level of significance

Adjusted R² is 0.5976 F = 6.569*.

The F statistic is 6.569, and significant at the 1% level. Therefore, the model is useful in predicting the relationships between Services Exports and the independent variables and the indicators. The adjusted coefficient of determination (R²) indicates that the regression model explains 59.76% of the variation in Services Exports. Moreover, the t statistic of the Real Effective Exchange Rate, World GDP, Foreign Direct Investment and Inflation are significant at the 1% level. The t statistics of Tertiary Education Graduates and Lagged Service Exports are significant at the 5% level. However, the t statistic of Employment in the Services Sector and Internet Diffusion are insignificant. Therefore, these results support Research Objective 1 and Research Objective 3.

The significant slope coefficients of the six independent variables suggest that an increase in World GDP, Tertiary Education Graduates and Foreign Direct Investment will have positive effects on Services Exports. However, Lagged Service Exports, the Real Effective Exchange Rate and Inflation negatively affect Services Exports.

4.3.2 Results Pertaining to Research Objective 2 and Research Objective 3

The second regression model uses Services Imports as the dependent variable. The three independent variables are Lagged Services Imports (IM [-1]), Real Effective Exchange Rate Index (PIM), and Domestic GDP Growth (DY). In addition, the five indicators of the domestic business environment are Foreign Direct Investment (FDI), Employment in Services Sector (EMP), Tertiary Education Enrolment (EDU_E), Inflation (INF) and Internet Diffusion (INT_D). The results of the regression analysis are presented in Table 4.5.

Table 4-5 Regression results relating to Equation (8)

Variables	Coefficient	Std.Error	t-Statistic
IM(-1)	-0.6836*	0.1293	-5.2844
PIM	-0.0031*	0.0010	-2.8765
DY	0.0002	0.0116	0.0151
FDI	0.5468*	0.1049	5.2109
EDU_E	0.0067**	0.0028	2.4019
EMP	0.0063	0.0074	0.8562
INF	0.0755***	0.0419	1.8002
INT_D	0.0048**	0.0019	2.5743

Note: *statistically significant at the 1 percent level of significance
 **statistically significant at the 5 percent of significance
 ***statistically significant at the 10 percent level of significance
 Adjusted R² is 0.6488; F = 7.927*.

The F statistic is 7.927, significant at the 1% level. Hence, the model is useful in predicting the impacts of the explanatory variables on Services Imports. The adjusted coefficient of determination indicates that the regression model explains 64.88% of the variation in Services Imports. The t statistic of Lagged Services Imports, the Real Effective Exchange Rate and Foreign Direct Investment are significant at the 1% level. The t statistic of Tertiary Education Enrolment and Internet Diffusion is significant at 5% level. The t statistic of Inflation is at the 10% level. However, the t statistic of Domestic GDP Growth Rate and Employment in Services Sector are insignificant. Therefore, the results support Research Objective 2, and Research Objective 3.

The slope coefficient of the six significant explanatory variables indicates that, Tertiary Education Enrolment, Foreign Direct Investment, Inflation and Internet Diffusion have a positive influence on Services Imports. However, the effect of Lagged Services Imports on Services Imports and the Real Effective Exchange Rate are negative.

Chapter 5

Discussion and Conclusion

5.1 Chapter Introduction

This chapter reviews the empirical findings of this study and discusses the implications of the results presented in Chapter 4. The major contributions of this current research are highlighted. In particular, the theoretical implications of testing the structural model measuring the relationships between the domestic business environment and trade in services are discussed. The practical implications of the finding are also identified and discussed. Further, the limitation and avenues for future research are presented in this chapter.

5.2 Summary of the Major Contributions of This Research

5.2.1 Summary of Key Facts in This Research

China has a complex business environment that impacts on its economic development and the world's economic expansion. However, there is no published research on China that identifies and constructs the indicators of the domestic business environment across all provinces at a national level. Importantly and to date, this current research is seminal as a set of testable national level indicators of the domestic business environment for China are identified and constructed. The annual data sets of the indicators were constructed from the databases of the National Bureau of Statistic of China and the World Bank between the period 1983 and 2014.

This research has identified five testable national level indicators of the domestic business environment in a Chinese context. The five indicators are: foreign direct investment (FDI), employment in the services sector, tertiary education, inflation, and internet diffusion. The findings of the literature review presented in Chapter 2 note that the majority researchers have modelled sets of firm-level indicators of the domestic business environment only. The sets of indicators used in these studies have been collected and provided by the World Bank to evaluate the effects of the domestic business

environment on dependent variables such as the trade in services in the selected OECD countries (Gani & Clemes, 2013) and output and productivity in Sub-Saharan African countries (Bah & Fang, 2015). In terms of the doing business indicators collected for China, the World Bank has collected the data for constructing the doing business indicators based on interviews with representatives of firms operating only in Beijing and Shanghai, which are the most developed cities in China.

In addition, the important relationships among the five indicators of domestic business environment and the trade in services (services exports and services imports) in China were empirically examined and analysed in this current research using structural equations. The findings on this study show that for services exports tertiary education and FDI have a significant positive effect on services exports, while inflation significantly and negatively impacts on services exports. Further, employment in the services sector and Internet diffusion have a positive but non-significant impact on services exports. Moreover, China's services imports are significantly and positively impacted by education level, inflation, FDI, and Internet diffusion, while employment in the services sector has positive impact but non-significant effect on services imports.

Further, the most to the least influential indicators were also identified in this research. FDI is the most significant indicator that impacts on the development of both China's services exports and services imports. In addition, internet diffusion has the least impact on China's service exports, while the employment in the service sector has the least impact on China's services imports.

5.2.2 Summary of the Research Gaps, Objectives and Questions

This current research identifies and closes three main research gaps:

Research Gap One is that there is no concise and consistent set of national level indicators of the domestic business environment that can be empirically modelled in a Chinese context.

Research Gap Two is there the absence of published empirical research on investigating and examining the effects of the domestic business environment on trade in services in China.

Research Gap Three is the lack of published empirical research focusing on identifying the most to the least important indicators of China's domestic business environment relative to the development of service exports and imports.

An econometric model is used to analyse the relationships among the five indicators (FDI, the employment in the services sector, tertiary education, inflation and internet diffusion) of the domestic business environment and China's trade in services (services exports and services imports). Therefore, the three research objectives are:

Research Objective 1 is to identify a set of potential indicators of the domestic business environment for China.

Research Objective 2 is to test the relationships between the set of indicators (tertiary education, the employment in the services sector, foreign development investment (FDI), inflation and internet diffusion) and the trade in services in China.

Research Objective 3 is to identify from the most to the least significant influential indicators of China's domestic business environment on its trade in services.

These three research objectives were addressed by testing the three questions developed and stated in Chapter 3:

RQ1: What are the potential national level testable indicators of the domestic business environment in the Chinese context?

RQ2: What are the effects of the indicators of the domestic business environment on China's trade in services?

R3: How do the indicators of the domestic business environment influence on China's trade in services- positive or negative?

5.2.3 Summary of Key Theoretical and Practical Contributions

This current research contributes to the economic literature by empirically analysing the relationship between the domestic business environment and China's trade in services. The theoretical contributions are discussed in detail in Section 5.4.1.

The three main theoretical contributions are summarized below:

This current research identifies a set of testable national level indicators of the domestic business environment in a Chinese context. The identified and constructed set of the testable indicators can be used as reference points for future research that explores the relationship between the indicators of the domestic business environment for the individual provinces in China. The indicators applied in this current study can also be used as a basis for determining the precise indicators for the trade in services for other world economies.

The conceptual research model developed and tested in this study can be applied in future research investigating the relationships between the domestic business environment and the trade in services can be applied to research on other nations and regions in China. Moreover, future researchers can also identify and introduce potential new indicators into the modelling framework.

This current longitudinal research is based on thirty-two years of annual data from 1983 to 2014 pertaining to China. Scholars can re-examine the effects of the indicators for a longer time period as the data set evolves. The empirical results generated from additional research will reveal the changes in the positive and negative effects of the indicators of China's domestic business environment on its trade in services.

The Chinese government has emphasised that the services sector is the key sector that will facilitate China's economic sustainability in the long run (Haacke, 2015). The empirical results generated from the equations formulated and used in this current research provide a valuable measurement framework that will assist Chinese policy makers and financial investors as they develop and

implement effective strategies for the further development of services related trade. The practical contributions are discussed in detail in Section 5.4.2.

The three main practical contributions of this study are summarized below:

China is seeking a path to transform from a manufacturing-driven and export-led economy to a services-driven economy (Liu & Yang, 2015). Chinese policy makers can use the empirical results generated in this research to help improve China's trade policy and encourage more financial industries to invest in China's services related businesses.

For the most part, China lacks a services culture and its manufacturing sector has been the key sector for its economic development among the three main sectors (agricultural, manufacturing and services) (Chen & Whalley, 2014). This current research has discussed the main differences between the services and physical goods. An improved understanding of the particular nature of services can help investors to more accurately segment service consumers which will contribute to the expansion of China's services sector. An improvement in the performance of China's service offerings will increase the share of China's services in the global marketplace.

The empirical findings in this current research illustrate that several indicators of the domestic business environment can be applied to accelerate the process of improving China's trade in services. The Chinese government can focus more on the positive, significant indicators to improve the development and volume of China's services exports and imports. Moreover, the positive but insignificant variables should be investigated further to ascertain if an improvement in the indicators would support an increase in China's trade in services.

Section 5.3 discusses the empirical findings from testing the three research questions. Section 5.3.1 discusses the results relating to Research Objective 1; Section 5.3.2 discusses the results relating to Research Objective 2; and Section 5.3.3 discusses the results relating to Research Objective 3. Section 5.4 discusses the theoretical and practical implications generated from the findings in this current

research. The limitations of this research and the directions for future research are discussed in Section 5.5 and Section 5.6, respectively.

5.3 The Relations between the Dependent Variables and Independent Variables

5.3.1 Conclusions Pertaining to Research Objective One

Research Objective One was satisfied as a set of five specific testable indicators of the domestic business environment for China were identified: FDI, employment in the services sector, tertiary education, inflation, and internet diffusion.

5.3.2 Conclusions Pertaining to Research Objective Two

Research Objective Two was satisfied as the results of this research show that certain indicators of the domestic business environment have an impact on the growth of China's trade in services. In particular, the results confirm that the effects of the five indicators of the domestic business environment on the growth of services exports and imports vary in significance. This finding is supported by Gani and Clemes' (2013) results, which is the only published empirical research that has investigated and found important relationships between the key indicators of the domestic business environment and the trade in services in a selection of countries. Gani and Clemes (2013) aggregate the data used for the indicators based on the selected low-income, middle-income and high-income OECD countries. However, this current seminal research focuses solely on the China's economy and examines the relationships between the selected indicators of the domestic business environment and the trade in services. The relationship between all five indicators have not been examined using a comprehensive modelling approach. The empirical findings for each indicator are discussed as follows:

FDI

FDI positively and significantly impacts on the growth of China's services exports. This result is consistent with the findings in previous studies on other countries, which confirm the positive and significant effect of FDI on services exports in Palestine (Morrar & Gallouj, 2016), India (Joshi, 2012),

and Cambodia (Cheong Tang & Wong, 2011). In addition, the findings of this current study also show that FDI has a positive and significant influence on the growth of services imports in China. This result is supported by the empirical findings of Wong et al., (2009) study on Singapore. In addition, Dash and Parida (2012) find that FDI has a positive and statistical significant influence on services exports, however, there was no causality from FDI to services imports in their study on India. The authors (2012) suggest that exports of services has a complementary relationship with FDI in India. Further, the significant and positive effect between FDI and services exports and imports suggest that higher FDI inflows influence on the growth of China's services exports and imports.

Tertiary Education

The results show that tertiary education has a positive and significant impact on both the growth of services exports and imports in China. These findings differ from those of Tang et al.,'s (2013) results indicating that the influence of tertiary school enrolment is positive but insignificant on the bilateral trade in services in China and OECD countries. Tang et al., (2013) focus on the relationship between tertiary education enrolment and the selected two services industries: transportation, and other services (total services minus travel and transport). The authors note that the other services analysed in their study are mainly labour-intensive industries, which require increasing the number of qualified, skilled labours to be employed in the selected service industries. Hence, Tang et al., (2013) report that tertiary school enrolment is positive but insignificant in their modelling framework. The results for the positive and significant effects of the education level on China's services exports and imports in this current study illustrate that higher education has an important role on the development its trade in services.

Employment in the Service Sector

Employment in the services sector has a positive but insignificant impact on both the growth of China's services exports and imports. There is lacking of published empirical studies that investigate the relationship between China's employment in the services sector and its trade in services. Liu and Yang's (2015) analyse the productivity between China and India, and find a small productivity growth gap

between the two countries. The author argues that an increase in the number of people employed in China's services sector has the potential to improve the overall productivity growth in its services sector. The authors suggest that this initiative will help China to maintain a competitive advantage in the services sector.

Inflation

There is a negative and significant relationship between the inflation and the growth of the service exports. Moreover, the inflation is positive and significant at the 10% level and impacts on the growth of China's services imports. These results are partially supported by the findings in the studies by Chaudhry et al., (2013) and Mani and Mishra (2014) which show a positive relationship between the rate of inflation and the growth of the services sector in Pakistan and India, respectively. The results of this current study suggest that the impact of inflation on services exports and imports differs according to the sector under investigation and this contention is supported by Chaudhry et al.,'s (2013) findings.

Internet Diffusion

The results of this study show that internet diffusion has positive but insignificant effect on the growth of China's services exports. This result is partially supported by the empirical findings in Gani and Clemes's (2013) study, which show that internet diffusion has a positive and statistically significant influence on services exports in the selected high-income OECD countries.

In addition, the findings of research reveal that there is a positive and significant relationship between Internet diffusion and the growth of the services imports in China. This result is supported by the findings in Meijer's (2014) study on a selected set of countries, noting that internet use had positive correlation with international trade in non-high-income countries. However, the empirical results in Choi's (2010) study show that internet diffusion has a significant but small effect on trade in services in the selected developed and developing countries. However, China was not included in the set of developing countries in Choi's (2010) study.

5.3.3 Conclusions Pertaining to Research Objective Three

Research Objective Three was satisfied as the most to the least significant influential indicators of the domestic business environment on trade in services in China were identified.

5.3.3.1 The Relationships between Services Exports and the Indicators of DBE

The results of the effects of the five indicators on services exports presented in Table 5.1 show that the β coefficient of FDI is positive and statistically significantly at the 1 percent level. Therefore, FDI is the most important influential indicator of the domestic business environment on the growth of services exports in China.

Table 5.1 The most to the least significant influential effects of the five indicators on services exports

	FDI	INF	EDU	EMP	INT_D
Coefficient	0.1728*	-0.0497*	0.0033**	0.0048	0.0011

Notes: * statistically significant at the 1 percent level;

** statistically significant at the 5 percent level;

*** statistically significant at the 10 percent level.

The importance of FDI is followed by that of the inflation, which is negative and statistically significant at the 1 percent level. These two empirical results indicate that a higher FDI increases the growth of China's services exports. However, a higher inflation decreases the growth of China's services exports. In addition, the education level and employment numbers in the services sector are less important to the growth of services exports in China when compared to the FDI and inflation. Further, Internet diffusion is positive but insignificant and is the least influential indicator among the five measured indicators impact on China's services exports.

5.3.3.2 The Relationships between Services Imports and the Indicators of DBE

The results of the effects of the five indicators on services imports presented in Table 5.2 show that the coefficients of the five indicators are all positive. FDI is statistically significant at the 1 percent level, which is also the most influential indicator of the domestic business environment on the growth of China's services imports. In addition, the importance of FDI is followed by the indicators of education

level (statistically significant at 5 percent level), Internet diffusion (statistically significant at 5 percent level) and the inflation (statistically significant at 10 percent level). Further, the coefficient of employment in the services sector is insignificant, indicating it has the least impact on China's services imports.

Table 5-1 The most to the least significant influential effects of the five indicators on services imports

	FDI	EDU	INT_D	INF	EMP
Coefficient	0.5468*	0.0067**	0.0048**	0.0755***	0.0063

Notes: * statistically significant at 0.1 level;
 ** statistically significant at 0.05 level;
 *** statistically significant at 0.01 level.

5.3.4 The Effects of Standard Control Variables on Services Exports and Imports

Lagged Services Exports and Lagged Services Imports

The empirical findings of this current research indicate that the lagged effects of the growth in services exports and imports have negative effects in China. The coefficients of lagged services exports and services imports are negative and statistically significant on China's services exports and services imports, respectively. Gani and Clemes (2013) also find that the lagged services exports and lagged services import both have a negative and statistically significant effects on the services exports and services imports in the high-income OCED and middle-income countries (China is aggregated in the middle-income countries). In addition, Clemes, Hu and Li (2016) find the similar empirical results that the lagged services sector has negative and insignificant effects on the growth of China's services sector. The empirical results in this current research imply that the growth of China's services exports and imports do not benefit from the lagged effects of the growth in services exports and imports, respectively.

The Real Effective Exchange Rate

The empirical results show that the real exchange rate has a statistically significant and negative effect on both China's services exports and imports. This empirical result is partially supported by Gani and

Clemes's (2013) findings, which showed a negative and insignificant relationship between the real exchange rate and services exports, and a positive and significant relationship between the real exchange rate and services imports in the selected high-income countries. In addition, the findings in this current research suggest that a devaluation in China's currency is beneficial for its services exports and imports.

World Income

The empirical results in this current research show that the world income has a positive and statistically significant on the growth of China's services exports. The findings are supported by the findings in previous studies. For example, Thomas (2016) reports that the world income has a statistically significant and positive effect on India's services exports. Gupta et al., (2015) also explain that world income positively and significantly impacted on the India's IT experts. Gani and Clemes (2013) also report that the world income has a positive and significant effect on the growth of services exports in the selected low-income countries.

The positive and significant impact of the world income on China's services exports implies that a growing world economy can increase the demand for, and the volume of, China's services exports. The significant effect of the world income also indicates that the growth of China's services exports rely heavily on the world's economic conditions. The results for world income suggest that it is not a simple process to reduce China's current trade deficit in services, given China's current dependence on importing services from the rest of the world.

Domestic Income

The empirical results show that the domestic income has a positive but nonsignificant impact on the growth of China's services imports. This result is partially supported by the findings in previous studies. For example, Gani and Clemes (2013) find that the growth rate of domestic GDP had a positive, strong impact on services imports in the selected low, middle and high-income countries. Thomas (2016) also demonstrate that an increase in India's domestic income can increase its services imports.

The positive coefficient sign of domestic income in this current research suggests that an increase in the growth of China's domestic income could act to increase the demand for its services imports. Moreover, a growing GDP may encourage more individuals and organizations to participate in China's services-related activities.

5.4 Contributions of This Research

Confirming or disconfirming the three research questions stated in Section 4.3 and satisfied the three research objectives stated in Chapter 3. In doing so, this research makes theoretical and practical contributions to the economic literature on the effects of the indicators of the domestic business environment and China's trade in services.

5.4.1 Theoretical Contributions

An econometric model is used as the theoretical framework to examine the effects of the domestic business environment on the trade in services in China. A set of five testable indicators of the domestic business environment is identified and then modelled at the national level in a Chinese context. Further, the findings of this current study show that the effects of the five indicators on the China's trade in services (services exports and imports) vary in significance. The four theoretical contributions that this research makes to the economic literature are discussed in the following paragraphs.

The most important theoretical contribution of this study is that it is the first empirical research that identifies a set of national level testable indicators (FDI, tertiary education, employment in the services sector, inflation, and Internet diffusion) of the domestic business environment in a Chinese context. The literature reveals that only a limited number of scholars have used firm level data from the World Bank database as the indicators of the business environment to examine their effects on economic growth in: Iran and the Middle East and North Africa (MENA) countries (Fatemeh et al., 2016), the trade in services in the selected countries (Gani & Clemes, 2013), and investment potentials in a selection of Pacific Island countries (Gani & Clemes, 2015).

The set of indicators used in this current study will provide a platform for continuing research that investigates the effects of the indicators of the domestic business environment on the trade in services for China and for other countries. For example, future scholars can use the set of indicators of the domestic business environment to test their effect on the trade in services at a provincial level in China. Moreover, the identified indicators can also be used to examine their effects on the trade in selected service industries on a national or region level in China. These types of modelling approaches will allow a more refined examination of the indicators impact on China's trade in services.

In addition, the structural equation modelling framework used and developed in this study can be applied on a global basis as other countries may want to test the effects of their own indicators of their domestic business environment on the growth of the trade in services. For example, the five indicators in this current study can be considered as a reference point for future researchers who may also want to identify additional national level testable indicators of the domestic business environment in the country under investigation.

Further, this current longitudinal research contains available data for thirty-two years from 1983 to 2014. Future researchers can expand the timeframe of this current study and add subsequent years as time progresses. In a Chinese context, new data can be merged with the data in this current study to determine the effect of the domestic business environment on China's trade in services. The future empirical findings can illustrate where the barriers of China's domestic business environment on its trade in services are diminishing or increasing.

This research also contributes to the economic literature by improving the understanding of the relative impact of the five indicators of the domestic business environment on China's trade in services. For example, this research reveals that FDI has the strongest impact on the growth of services exports in China, followed by the indicators of inflation, education level, employment in the services sector, and Internet diffusion. In addition, the results of this study indicates that FDI is also the most important influential indicator on China's services imports, followed by the indicators of education level, Internet diffusion, inflation, and employment in the services sector.

The selected five indicators and three trade control variables examined in this current research can be valuable references points for future research that explores China's trade in services. In terms of the published data that is currently available on China's trade in services, this current research indicates that China needs more detailed data on its services sector. More recently, China's official published statistics on its services sector have become more in-depth and detailed. However, the level of the detail of the data collected for China's services sector still lags behind the data that is publicly available for its agricultural and manufacturing sectors. The Chinese government should consider providing a more detailed classification and clearer segmentation of data for its trade in services. More robust data sets will improve the data available for researchers who plan to extensively investigate China's trade in services, either on a regional or national level.

Finally, this current research adds to the extant empirical literature that has analysed China's trade in services. This current research has examined China's trade in services at macroeconomic level. A review of the literature shows that the published empirical studies on China's trade in services are sparse, especially when compared to published empirical studies on China's goods trade. The existing published studies focus primarily on the conceptual issues surrounding China's services and its trade in services. However, the number of published research that empirical models China's trade in services need to be increased as the importance of the growing services sector has been reported in several recent studies.

Moreover, China's goods trade has been widely investigated and examined from various perspectives (e.g., the relationship between goods trade and employment, the relationship between goods trade and China's overall economy). The seminal empirical findings in this current should act as a catalyst to raise the level of interest in China's trade in services and encourage further investigation by scholars.

5.4.2 Practical Contributions

In 2016, China's Thirteenth Five-Plan (2016-2020) notes that the Chinese government will continue with the Twelfth Five-Plan (2011-2015) to transfer China's economy toward a services economy and

place a strategic priority on the development of the trade in services (Wang, Estrada, Conrad, Lee, & Park, 2016). China is aiming to reach 56 percent of the value added in the services sector to its GDP by 2020. The value added of the services sector was 50.5% in 2015 (World Bank, 2016b). However, China's services sector has been underappreciated when compared to the attention that the manufacturing sector has received for almost three decades.

Several scholars report that China's services sector is still underdeveloped (Clemes, Hu, & Li, 2016; Zheng et al., 2011). For example, the current share of China's services sector to its GDP was 50.5% in 2016, which still lags behind the general level of China's economic development and the world's average level of services sector development (Ding & Xu, 2015). The volume of China's trade in services is still much smaller than its volume of merchandised trade (Wu, 2015). China has a trade deficit in services since 1992, which widened to US\$260 billion in 2016 (United Nations Conference on Trade and Development, 2016).

The findings of this current research provide several practical contributions for policy-makers and policy-followers to facilitate the growth in China's domestic business environment and its subsequent impact on its trade in services. The following discussion details each of the practical contributions that have evolved from the empirical results presented in this current research.

This current research identifies the importance of the domestic business environment and its impact on the trade in services for China's future economic development. The empirical findings of this research show that the indicators of the domestic business environment may affect the growth of China's trade in services at different levels of significance. Hence, China's policy makers should improve their understanding of China's domestic business environment in relation to its impact on trade in services to foster better services trade policies.

China's policy makers should also increase their efforts to create a stable and competitive domestic business environment for both domestic and international investors. Gani and Clemes (2013) note that a competitive business environment can reduce producers and investors' transaction costs which can

lead to substantial gains in the trade in services. A stable and competitive domestic business environment reduces risk perceptions and increases opportunities. These are two important factors that when combined will attract more domestic and international investors to seek investment opportunities in China.

China has a long history of developing the understanding and resourcing its agricultural and manufacturing sectors. However, there is still a lack of general understanding about the definition and classification of services and what delineates them from physical goods, despite the increasing demand for all types of services in China. Chinese consumers may not have the same level of understanding of the consumption process for services as they do for physical goods, primarily due to the intangible nature of services. The Chinese government should improve the universal understanding of services and publicize the importance of the services sector for China's society. One of the methods that will foster these changes is to explain the differences between goods and services and the way services are consumed relative to goods. This strategic approach will increase the general knowledge of services for Chinese consumers as it did for consumers in several of the western countries in the early 1990's.

In addition, Chen and Whalley (2014) argue that China's trade in services is a key that can improve the productivity of China's services sector, increase the consumption of services, and enhance China's overall national economic development. The development of China's services trade will help to rebalance the Chinese economy from its heavy reliance on its goods exports and manufacturing sector. Therefore, China's government should treat its services sector with a higher priority as the sector has an increasing impact on China's sustainable economic development. For example, the Chinese government should focus on improving the competitive advantage of its service exports, which have been a major catalysis of economic growth in many other developing countries. Currently China aids many developing countries by providing professional services for the basic infrastructure development such as construction, engineering and financial services. China should continue to export its services expertise to satisfy the infrastructure needs in these developing countries.

Wu (2015) points out that there are major profitable service industries that are still under strict control of the Chinese government. China should adhere to the guidelines of the WTO and the rules of GATS and this initiative will also act to expand and liberalize its services sector. The Chinese policy-makers should continue fostering the correct policies that will facilitate the development and liberalization of its trade in services. These policy adjustments include gradually opening up China's domestic services sector and encouraging foreign direct investment into its services sector.

The Chinese government should also promote transparency in its services sector, which can facilitate China's trade in services in the global market. Yi (2002) points out the importance of transparency in services is that it assists the promotion of a rules-based approach to trade policy at the national level under the WTO rules and commitments. The Chinese services providers should have access to the information on the regulations and obligations of transparency. This information will help them to strengthen their competitive advantages with spill-over effects occurring for China's trade in services. For example, the Chinese government could use the internet to communicate with China's service providers and provide them with up-to date publications relevant to the trade in services under the WTO and GATS rules.

This current empirical research illustrates that the effects of the indicators of the domestic business environment on China's services exports and imports vary in significance. For example, FDI is the most important indicator variable impacting on the development of China's services exports and imports. Therefore, China's policy makers can use the empirical findings of this current research as a reference point to adjust the general level of the indicators of the domestic business environment to achieve policy objectives. In addition, China's trade policies should be implemented with dynamism and in conjunction with the policy objectives of the domestic business environment, such as FDI and education. Entrepreneurs may be able to use the indicators of China's business environment identified in this current research to analyse and improve their trade strategies. A positive outcome of this type of policy change would be to increase China's trade in services and subsequently reduce the trade deficit between China's services exports and imports in the future. The Chinese government should also

continue to monitor and measure the indicators of the domestic business environment at a national and provincial level. China's trade policies should be adjusted in accordance with the empirical results of the measurement on the effects of the indicators on its trade in services. The following section discusses the practical contributions of each indicator of the domestic business environment in this current research.

5.4.2.1 The Five Indicators Relating to Trade in Services

FDI

When China's trade in services is compared to its merchandise trade, the trade in the services sector is lower in volume and has much lower growth rates. Therefore, China should increase the FDI inflow into the services sector to ensure the sector's continued development in the coming decade. China should also increase the efficiency of its services sector through increased FDI, in order to achieve higher returns to scale and decrease of the domestic costs of services provision (Tang et al., 2013).

The positive and significant effect of FDI inflows on China's trade in services may eventuate in an improvement in the variety of services available and indirectly improve the general level of service quality across the industries involved in the rationalization (Fernandes & Paunov, 2012). China should gradually liberalize foreign investment into its services sector. The liberalization of foreign investment can increase domestic competition and reduce the marginal cost of services. For example, foreign-owned services providers could introduce new technology to attract new customers and better satisfy the needs of existing customers. Ipek and Kizilgöl (2015) suggest that, in general, trade barriers should be reduced to encourage FDI inflows towards less developed industries or sector as they usually stimulate domestic business activities. Moreover, FDI may bring management knowledge and best practices from foreign-owned service providers to China's service providers (Sohn, 2016). Hence, as China opens its domestic economy to more foreign investment and trade in services the proportion of FDI to its services sector will increase accordingly.

Tertiary Education

The positive and significant effect of tertiary education on China's trade in services indicates that an educated and qualified workforce are important for the development of trade in services. Tertiary education is proven to be a good investment as higher educated employee have lower displacement rates and higher reemployment rates. In order to meet the increasing demand of a high-quality workforce for China's service sector, the government should continue to encourage younger people to complete their tertiary education. China's government should also encourage employees to invest in their own continuing education in order to strengthen their employment future in the services sector.

The changes in China's middle class has also influenced China's overall consumption patterns (Chen & Qin, 2014). Song, Cavusgil, Li and Luo (2016) point out that the level of education has a significant effect on the middle classes' consumption of manufactured-goods and cultural experiences (such as art exhibits, concerts and plays). However, there are still a large segment of people in the middle class that are not well educated. Therefore, the Chinese government needs to continue to improve the general education level of the middle class to increase the demand for services and enhance the trade in services.

Chen and Whalley (2014) note that China's service activities are shifting from the more traditional services to technology based and knowledge-intensive services. The growing number of technology based and knowledge-intensive services create demand for a larger number of higher educated and qualified employees. Increasing the number of qualified tertiary graduates that have the skills required for China's services sector will also contribute to the competitiveness of its trade in services in international markets.

In addition, the Chinese government should continue to fund the overall tertiary education sector. For example, an initiative on the part of the Higher Education Institutions to allocate resources so they can offer a wide variety of subjects focusing on services will improve the human capital advantage of China's services sector and enable more trade in services in global markets. The academic institutions

in many developed countries offer numerous and diverse subject offerings on services and graduates have a thorough understanding of the services sector when they enter the workforce. This is a sound strategy as the majority of developed countries have at least 70% of their GDP in services (e.g., the United States, United Kingdom, and Australia). China currently has 50.5% of its GDP in services. However, it is predicted that this percentage will increase in the coming five years to 55% as noted in the Five-Year plan.

Internet Diffusion

The positive but insignificant effect of internet diffusion implies that the utilization of the internet in service activities could be beneficial to the development of China's trade in services. However, the use of the internet in China's services sector still needs to be increased. China Internet Network Information Center (2016) reports that 95.2 percent of Chinese companies had computers for use in their office work in 2015. However, 89 percent of internet users in companies reported they only used their computers to send emails or browse the internet. A co-ordinated strategy amongst Chinese companies to fully utilize the information technology will be beneficial as service industries that have created synergies between the new technology and their customs have increased their market share. In addition, China's enterprises should widen their business usage of the internet, such as gathering information from foreign buyers, finding new trading partners, and investigating new products and services.

The Chinese government and China's enterprises should also cooperate with each other to increase the maximum utilization of the internet in a business context. The Chinese government should increase funding for the private sector and HEI's to help improve the internet infrastructure and develop new technologies to increase the services tradability and reduce the costs of trade in services. For example, China could make improvement in information and communications technology, which enables firms to transfer their services internationally without their employees physically leaving China. Moreover, China's government should ensure that China's enterprises have a secure, safe and stable internet connections with other nations to reduce perceived risk and ultimately, facilitate the trade in services.

Employment in the Services Sector

The results in this current study show that employment in China's services sector is positive but insignificant. Thus, despite the fact that the quantity of the workforce in China's services sector has increased markedly, the quality of the workforce still needs to be improved. Lan, Liu and Schipke (2015) point out that labour productivity in China's services sector is generally lower than in its manufacturing sector. The authors argue that the quality of the workforce in China's services sector needs to be strengthened through more education and professional training. China should also improve regulations and policies to increase the minimum wage level for low-wage and low-skilled employees in the services sector.

Chen and Whalley (2014) suggest that the Chinese government should encourage foreign experts, Chinese scholars and students who are overseas to return to China and join a talent pool. The authors contend that a talent pool could partially fill the increased demand for educated and high-quality employees in China's services sector.

In addition, Wu (2015) notes that China has a sizable pool of rural surplus labours that need to be re-employed as employment in the labour-intensive manufacturing industries is declining. However, the majority of China's rural labours have a relative low level of education, a lack of vocational training and have low-working skills. The combination of these factors results in the human capital level of rural labour lagging behind the progress of modernisation (Li & Qian, 2011). China's service sector could benefit from the surplus of rural labourers if the level of human capital amongst this group could be improved. Therefore, the Chinese government should encourage and help the rural workforce to improve their skill level, so they have the ability to contribute to China's services sector.

Further, local governments and the private sector in China could work together to identify and study the characteristics of employees in its services industries. The background of employees in China's services industries, such as their demographics and level of education, are diverse. Recognising the different characteristics of the employees in China's service sector would help segment the employee market and provide more targeted benefits. Moreover, employees in China's manufacturing sector

are steadily shifting to its services sector. Identifying the individual characteristics of the employees would also help those people shifting from the manufacturing sector to the services sector to find suitable positions in the services sector.

Inflation

The negative and significant effect of the inflation suggests that an increase in the inflation can lower the competitiveness of China's trade in services. Moreover, the negative effect of inflation may also indicate that the price of China's services is higher than the price of foreign services in China. Therefore, the Chinese government should investigate how, and to what degree, an increase in the inflation impacts on the growth of trade in services in China. In addition, Martin and Wörz (2012) report that ensuring a high level of international competition could lower China's inflation and subsequently the pressure that an increase in the inflation places on trade. The Chinese government should encourage more competition into its domestic services market which will act to slow the level of price increases in its services sector.

5.4.2.2 Trade Control Variables Relating China's Trade in Services

The Real Exchange Rate

The negative and significant effects of the real exchange rate on China's trade in services indicates that a depreciation in China's currency is likely to increase the volume of China's services exports and China's services imports. The empirical results also illustrate that China's overall demand for services does not decrease as a result of an increase in the international price of services. A plausible reason for this result is that China's domestic services may not be at a quality level high enough to compete with international services, even when the prices of the international services increase in China. Therefore, China's government should strengthen the competitiveness of its key services industries such as finance and tourism, to increase the competitiveness of China's services sector against foreign competition.

World Income

The significant and positive effect of the world income on China's services exports suggests that an increase in the growth of world income will lead to a growth in China's services exports. The empirical results also imply that continuing growth in China's services exports is highly dependent on the performance of the global economy. Therefore, China should increase the international competitiveness of its major services industries, to lower the potential risks caused by fluctuations in the global economy. For example, the Chinese government could support the further development of China's modern services industries, such as information technology, professional, and business services, to improve their efficiency and better equip these industries to manage the fluctuations that will occur in the global economy.

Domestic Income

The positive and nonsignificant effect of domestic income on China's services imports implies that the growth of China's services imports is not sensitive to the changes in the level of China's domestic income. However, these empirical results are inconsistent with the findings in the previous published empirical studies on other countries, such as India (Thomas, 2016) and Jordan (Abu-Lila, 2014), where the growth of domestic income increased the volume of services imports in the sampled countries. The empirical results in this current study may reflect China's unique business environment. For example, China relied heavily on its manufacturing sector for employment and economic growth when compared to India that is increasingly relying on its services sector to grow its economy. This is particularly case in the past ten years for India's service sector as the Indian government has resourced the development and expansion of its services sector. Further, Shu, Lin, and Ye (2013) point out that China has a history of emphasizing the production of manufactured goods while ignoring services.

Further, the development of technology has improved the overall level of efficiency of China's services sector. For example, Pencea and Balgar (2016) note that Chinese consumers commonly use Online to Offline (O2O) to buy services such as purchasing travel tickets and booking hotel rooms. Consumers are now using the internet to purchase a much wider range of services, such as healthcare, financial

services and entertainment. Therefore, the Chinese government should continue to facilitate the development of new technology to simplify purchasing services for consumers, and ultimately, benefit its services sector.

5.5 Limitations of The Research

The findings in this current research provide an improved understanding of the important linkage between the China's domestic business environment and its trade in services. However, there are limitations of the research that have been identified and these should be noted.

First, this current research has identified a set of five testable national level indicators of the domestic business environment that were testable in a Chinese context. However, other potential indicators of the domestic business environment in a Chinese context are not included in the modelling framework. Scholars have investigated various indicators of the domestic business environment in research on other countries. For example, Gani and Al-Abri's (2013) find that governance provides an important linkage between domestic business activities, foreign investors, and economic outcomes in Gulf Cooperation Council countries. More recently, Grosanu, Bota-Avram, Rachisan, Vesselinov, and Tiron-Tudor (2015) determine that the variable of governance statistically impacts on the business environment and entrepreneurship in the sampled countries. However, this current research did not examine governance as an indicator variable of the domestic business environment in a Chinese context.

This is the first empirical research that has examined the effect of the domestic business environment on China's trade in services therefore a direct comparison with the results of other extant studies is not possible. In the same vein, comparing longitudinal results with those of earlier studies is not possible

Third, this current research used secondary data from two databases: National Bureau of Statistics of China and the World Bank. The availability of data mandated that the duration of both of the data sets in this current study were from 1983 to 2014. Data on the indicators of the domestic business

environment impact on China's trade in services before the Chinese government implemented its "reform and open-up" policy in 1978 were not available and therefore could not be measured.

Directions for future research are suggested in the following section.

5.6 Avenues for Future Research

Future researchers could identify other potential important and testable indicators of the domestic business environment in a Chinese context. An investigation of the effects of other potential indicators on trade in services in a Chinese context would be useful to further understand the relationship between the domestic business environment and trade in services in China.

In addition, future researchers could use the framework developed for this current research to examine the effect of the indicators of the Chinese domestic business environment on selected services industries. This type of fine grain analysis should provide valuable insights into the effects of the domestic business environment on China's trade in the selected services industries.

Moreover, the structural model used in this current study can also be applied to cross regional research in order to examine the effects of the domestic business environment on the trade in services in China's provinces. For example, cross regional research can be conducted on low, middle and high-income categories of provinces. The cross regional research among the provinces should further enhance the understanding of importance of the domestic business and trade in services.

Further, the effects of the China's domestic business environment on other macroeconomic fundamental variables could also be empirically assessed. For example, Gani and Clemes (2015) find that the business environment matters for the level of FDI inflows in selected Pacific Island countries. A more comprehensive analysis of the effects of the domestic business environment on explanatory macroeconomic variable should provide an improved understanding of China's domestic business environment.

Appendix A

Regression Results

A.1 Regression Results Relating to Services Exports

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.208437	0.065638	3.175544	0.0044
EX(-1)	-0.345983	0.140234	-2.467176	0.0219
PEX	-0.002454	0.000556	-4.413097	0.0002
WY	0.041660	0.011234	3.708472	0.0012
FDI	0.172805	0.048077	3.594314	0.0016
EDU_G	0.003310	0.001212	2.729789	0.0122
EMP	0.004833	0.003576	1.351378	0.1903
INF	-0.049702	0.015781	-3.149394	0.0047
INT_D	0.001135	0.000880	1.290361	0.2103
R-squared	0.704908	Mean dependent var		0.098042
Adjusted R-squared	0.597601	S.D. dependent var		0.104055
S.E. of regression	0.066007	Akaike info criterion		-2.360408
Sum squared resid	0.095853	Schwarz criterion		-1.944090
Log likelihood	45.58633	Hannan-Quinn criter.		-2.224699
F-statistic	6.569113	Durbin-Watson stat		2.317597
Prob(F-statistic)	0.000209			

A.2 Regression Results Relating to Services Imports

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.261132	0.146251	1.785512	0.0880
IM(-1)	-0.683622	0.129367	-5.284374	0.0000
PIM	-0.003137	0.001091	-2.876488	0.0088
DY	0.000175	0.011575	0.015101	0.9881
FDI	0.546781	0.104928	5.210997	0.0000
EDU_E	0.006718	0.002797	2.401904	0.0252
EMP	0.006318	0.007379	0.856198	0.4011
INF	0.075516	0.041948	1.800223	0.0856
INT_D	0.004837	0.001879	2.574320	0.0173
R-squared	0.742447	Mean dependent var		0.143107
Adjusted R-squared	0.648791	S.D. dependent var		0.235589
S.E. of regression	0.139617	Akaike info criterion		-0.862127
Sum squared resid	0.428844	Schwarz criterion		-0.445808
Log likelihood	22.36296	Hannan-Quinn criter.		-0.726417
F-statistic	7.927404	Durbin-Watson stat		1.826270
Prob(F-statistic)	0.000054			

Appendix B

Assumptions for Regression Analysis

B.1 Unit Root Test

B.1.1 Unit Root Test for Services Exports

Null Hypothesis: Services Exports has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.046395	0.0000
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EX)
 Method: Least Squares
 Date: 02/12/16 Time: 12:01
 Sample (adjusted): 1984 2014
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EX(-1)	-1.101630	0.182196	-6.046395	0.0000
C	0.107819	0.025781	4.182082	0.0002
R-squared	0.557650	Mean dependent var		0.001845
Adjusted R-squared	0.542396	S.D. dependent var		0.155619
S.E. of regression	0.105270	Akaike info criterion		-1.602227
Sum squared resid	0.321374	Schwarz criterion		-1.509712
Log likelihood	26.83452	Hannan-Quinn criter.		-1.572069
F-statistic	36.55889	Durbin-Watson stat		1.990484
Prob(F-statistic)	0.000001			

B.1.2 Unit Root Test for Services Imports

Null Hypothesis: Services Imports has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.050901	0.0000
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(IM)
 Method: Least Squares
 Date: 02/12/16 Time: 12:02
 Sample (adjusted): 1984 2014
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IM(-1)	-1.251133	0.177443	-7.050901	0.0000
C	0.177309	0.048130	3.683982	0.0009
R-squared	0.631583	Mean dependent var		0.006917
Adjusted R-squared	0.618879	S.D. dependent var		0.375390
S.E. of regression	0.231747	Akaike info criterion		-0.024000
Sum squared resid	1.557493	Schwarz criterion		0.068515
Log likelihood	2.372003	Hannan-Quinn criter.		0.006157
F-statistic	49.71520	Durbin-Watson stat		1.969217
Prob(F-statistic)	0.000000			

B.1.3 Unit Root Test for Real Effective Exchange Rate

Null Hypothesis: D(Real Effective Exchange Rate, 2) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.316893	0.0000
Test critical values:		
1% level	-3.699871	
5% level	-2.976263	
10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(PEX,3)

Method: Least Squares

Date: 05/26/17 Time: 14:12

Sample (adjusted): 1988 2014

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PEX(-1),2)	-2.623757	0.358589	-7.316893	0.0000
D(PEX(-1),3)	1.099040	0.255952	4.293929	0.0003
D(PEX(-2),3)	0.564661	0.155151	3.639439	0.0014
C	3.061327	2.337905	1.309432	0.2033
R-squared	0.797626	Mean dependent var		-1.218519
Adjusted R-squared	0.771230	S.D. dependent var		24.74911
S.E. of regression	11.83749	Akaike info criterion		7.916374
Sum squared resid	3222.901	Schwarz criterion		8.108349
Log likelihood	-102.8710	Hannan-Quinn criter.		7.973458
F-statistic	30.21702	Durbin-Watson stat		1.867256
Prob(F-statistic)	0.000000			

B.1.4 Unit Root Test for World Income

Null Hypothesis: World Income has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.429520	0.0014
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(WY)
 Method: Least Squares
 Date: 02/03/16 Time: 22:06
 Sample (adjusted): 1984 2014
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WY(-1)	-0.808388	0.182500	-4.429520	0.0001
C	2.369165	0.585791	4.044385	0.0004
R-squared	0.403546	Mean dependent var		-0.006452
Adjusted R-squared	0.382978	S.D. dependent var		1.670117
S.E. of regression	1.311889	Akaike info criterion		3.443154
Sum squared resid	49.91053	Schwarz criterion		3.535669
Log likelihood	-51.36889	Hannan-Quinn criter.		3.473312
F-statistic	19.62065	Durbin-Watson stat		1.861001
Prob(F-statistic)	0.000123			

B.1.5 Unit Root Test for Domestic Income

Null Hypothesis: Domestic Income has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.357539	0.0018
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(DY)
 Method: Least Squares
 Date: 02/03/16 Time: 22:07
 Sample (adjusted): 1985 2014
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DY(-1)	-0.669079	0.153545	-4.357539	0.0002
D(DY(-1))	0.440077	0.159696	2.755715	0.0104
C	6.553223	1.602724	4.088803	0.0003
R-squared	0.418934	Mean dependent var		-0.263333
Adjusted R-squared	0.375892	S.D. dependent var		2.485889
S.E. of regression	1.963865	Akaike info criterion		4.282345
Sum squared resid	104.1326	Schwarz criterion		4.422465
Log likelihood	-61.23518	Hannan-Quinn criter.		4.327171
F-statistic	9.733166	Durbin-Watson stat		1.784805
Prob(F-statistic)	0.000656			

B.1.6 Unit Root Test for Tertiary Education Enrolment

Null Hypothesis: Tertiary Education Enrolment has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.255670	0.0261
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EDU_E)

Method: Least Squares

Date: 02/03/16 Time: 22:07

Sample (adjusted): 1984 2014

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDU_E(-1)	-0.523511	0.160800	-3.255670	0.0029
C	5.189450	2.720527	1.907517	0.0664
R-squared	0.267665	Mean dependent var		-0.678885
Adjusted R-squared	0.242413	S.D. dependent var		13.03489
S.E. of regression	11.34550	Akaike info criterion		7.757860
Sum squared resid	3732.891	Schwarz criterion		7.850376
Log likelihood	-118.2468	Hannan-Quinn criter.		7.788018
F-statistic	10.59939	Durbin-Watson stat		1.960570
Prob(F-statistic)	0.002877			

B.1.7 Unit Root Test for Tertiary Education Graduate

Null Hypothesis: Tertiary Education Graduate has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.409045	0.0183
Test critical values:		
1% level	-3.661661	
5% level	-2.960411	
10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EDU_G)

Method: Least Squares

Date: 02/03/16 Time: 22:07

Sample (adjusted): 1984 2014

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDU_G(-1)	-0.434107	0.127340	-3.409045	0.0019
C	5.231309	2.204451	2.373066	0.0245
R-squared	0.286094	Mean dependent var		0.965428
Adjusted R-squared	0.261476	S.D. dependent var		11.75828
S.E. of regression	10.10476	Akaike info criterion		7.526231
Sum squared resid	2961.080	Schwarz criterion		7.618747
Log likelihood	-114.6566	Hannan-Quinn criter.		7.556389
F-statistic	11.62159	Durbin-Watson stat		1.632489
Prob(F-statistic)	0.001934			

B.1.8 Unit Root Test for Employment in Services Sector

Null Hypothesis: Employment in Services Sector has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.523537	0.0142
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EMP)

Method: Least Squares

Date: 02/03/16 Time: 22:08

Sample (adjusted): 1985 2014

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EMP(-1)	-0.689518	0.195689	-3.523537	0.0015
D(EMP(-1))	-0.203780	0.156974	-1.298178	0.2052
C	3.202121	1.198974	2.670717	0.0127
R-squared	0.541705	Mean dependent var		-0.377344
Adjusted R-squared	0.507757	S.D. dependent var		4.877231
S.E. of regression	3.421865	Akaike info criterion		5.392888
Sum squared resid	316.1474	Schwarz criterion		5.533008
Log likelihood	-77.89332	Hannan-Quinn criter.		5.437714
F-statistic	15.95703	Durbin-Watson stat		2.171315
Prob(F-statistic)	0.000027			

B.1.9 Unit Root Test for FDI

Null Hypothesis: **FDI** has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.223585	0.0025
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FDI)

Method: Least Squares

Date: 02/03/16 Time: 22:08

Sample (adjusted): 1985 2014

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.749100	0.177361	-4.223585	0.0002
D(FDI(-1))	0.401968	0.169169	2.376125	0.0248
C	0.089785	0.054047	1.661229	0.1082
R-squared	0.398327	Mean dependent var		-0.015386
Adjusted R-squared	0.353759	S.D. dependent var		0.326835
S.E. of regression	0.262740	Akaike info criterion		0.259335
Sum squared resid	1.863871	Schwarz criterion		0.399455
Log likelihood	-0.890028	Hannan-Quinn criter.		0.304161
F-statistic	8.937445	Durbin-Watson stat		1.782915
Prob(F-statistic)	0.001050			

B.1.10 Unit Root Test for Inflation

Null Hypothesis: D(Inflation) has a unit root
 Exogenous: Constant, Linear Trend
 Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.668859	0.0004
Test critical values:		
1% level	-4.309824	
5% level	-3.574244	
10% level	-3.221728	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INF_R,2)
 Method: Least Squares
 Date: 02/03/16 Time: 22:09
 Sample (adjusted): 1986 2014
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF_R(-1))	-1.359607	0.239838	-5.668859	0.0000
D(INF_R(-1),2)	0.432111	0.174571	2.475281	0.0204
C	-0.019524	0.305919	-0.063821	0.9496
@TREND("1983")	0.000357	0.016137	0.022151	0.9825
R-squared	0.591267	Mean dependent var		-0.041022
Adjusted R-squared	0.542220	S.D. dependent var		1.071952
S.E. of regression	0.725277	Akaike info criterion		2.322916
Sum squared resid	13.15067	Schwarz criterion		2.511509
Log likelihood	-29.68229	Hannan-Quinn criter.		2.381981
F-statistic	12.05490	Durbin-Watson stat		1.912701
Prob(F-statistic)	0.000045			

B.1.11 Unit Root Test for Internet Diffusion

Null Hypothesis: Internet Diffusion has a unit root
 Exogenous: None
 Lag Length: 7 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.372934	0.0017
Test critical values:		
1% level	-2.664853	
5% level	-1.955681	
10% level	-1.608793	

*MacKinnon (1996) one-sided p-values.

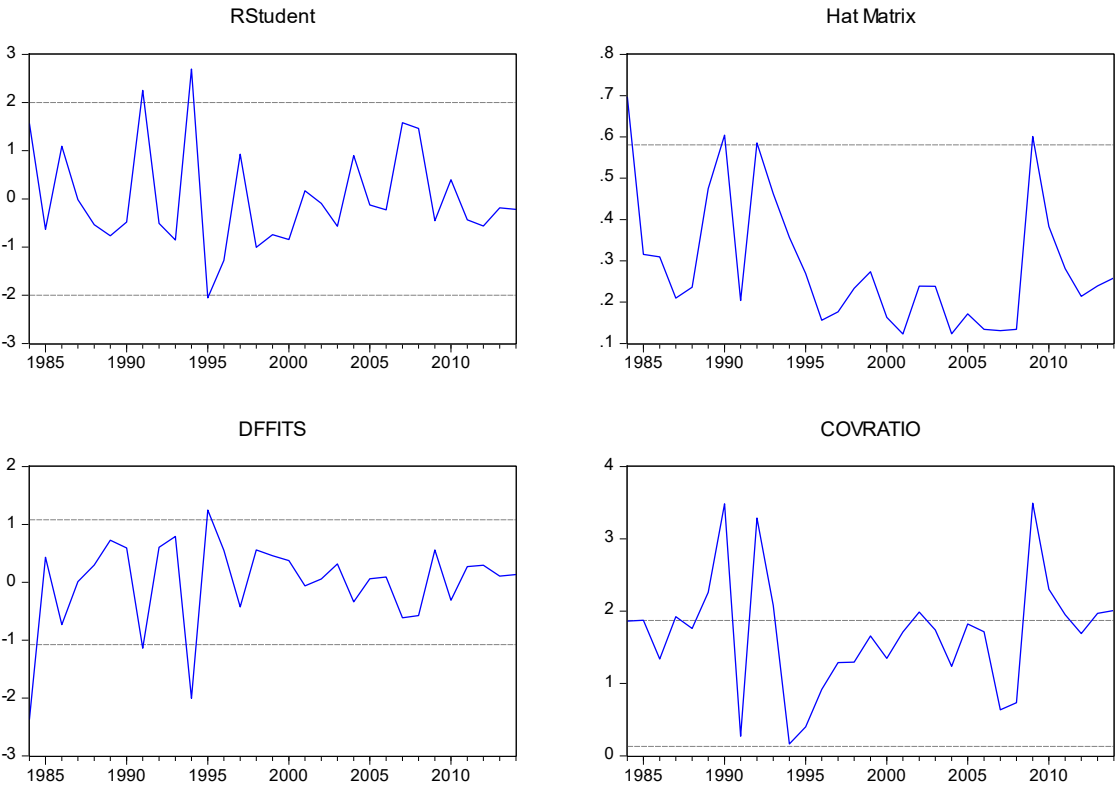
Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(INT_D)
 Method: Least Squares
 Date: 02/03/16 Time: 22:10
 Sample (adjusted): 1991 2014
 Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT_D(-1)	-0.657083	0.194811	-3.372934	0.0039
D(INT_D(-1))	2.113806	0.221796	9.530415	0.0000
D(INT_D(-2))	-0.110409	0.406740	-0.271448	0.7895
D(INT_D(-3))	0.975255	0.420291	2.320426	0.0339
D(INT_D(-4))	0.742385	0.379022	1.958687	0.0678
D(INT_D(-5))	1.608361	0.364132	4.416975	0.0004
D(INT_D(-6))	-0.267686	0.449880	-0.595016	0.5602
D(INT_D(-7))	1.939963	0.457336	4.241875	0.0006
R-squared	0.952212	Mean dependent var		2.054167
Adjusted R-squared	0.931305	S.D. dependent var		2.215924
S.E. of regression	0.580788	Akaike info criterion		2.012339
Sum squared resid	5.397032	Schwarz criterion		2.405024
Log likelihood	-16.14807	Hannan-Quinn criter.		2.116519
Durbin-Watson stat	2.469677			

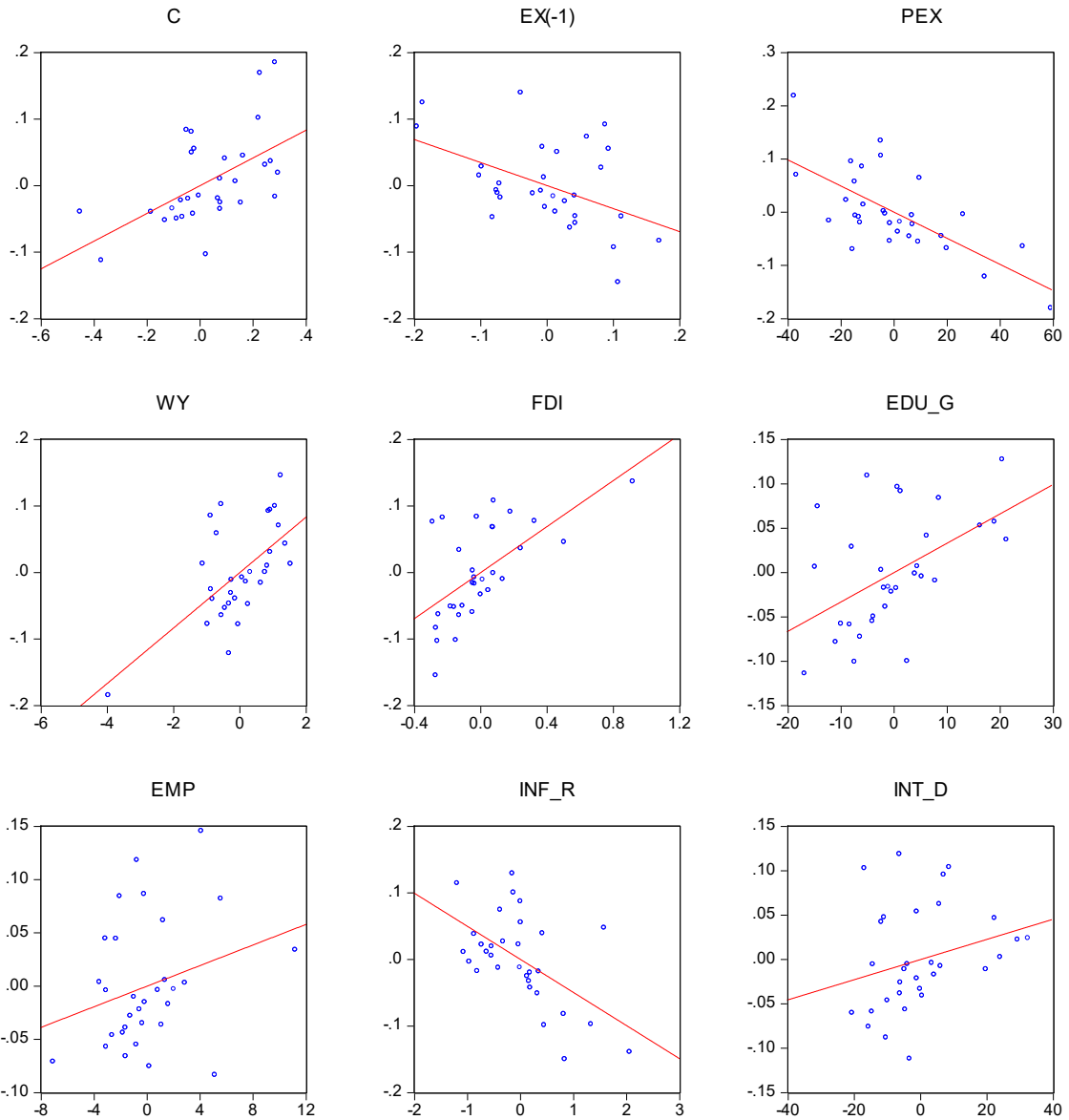
B.2 Outliers

B.2.1 Services Exports

Influence Statistics

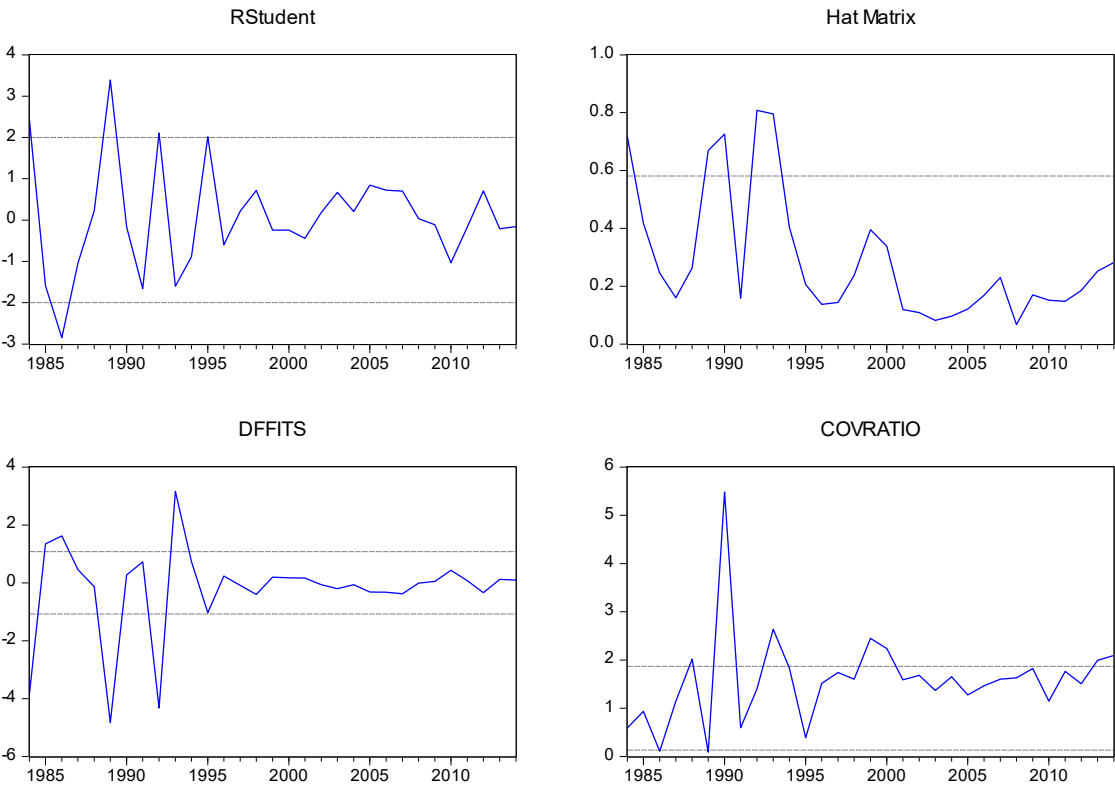


EX vs Variables (Partialled on Regressors)

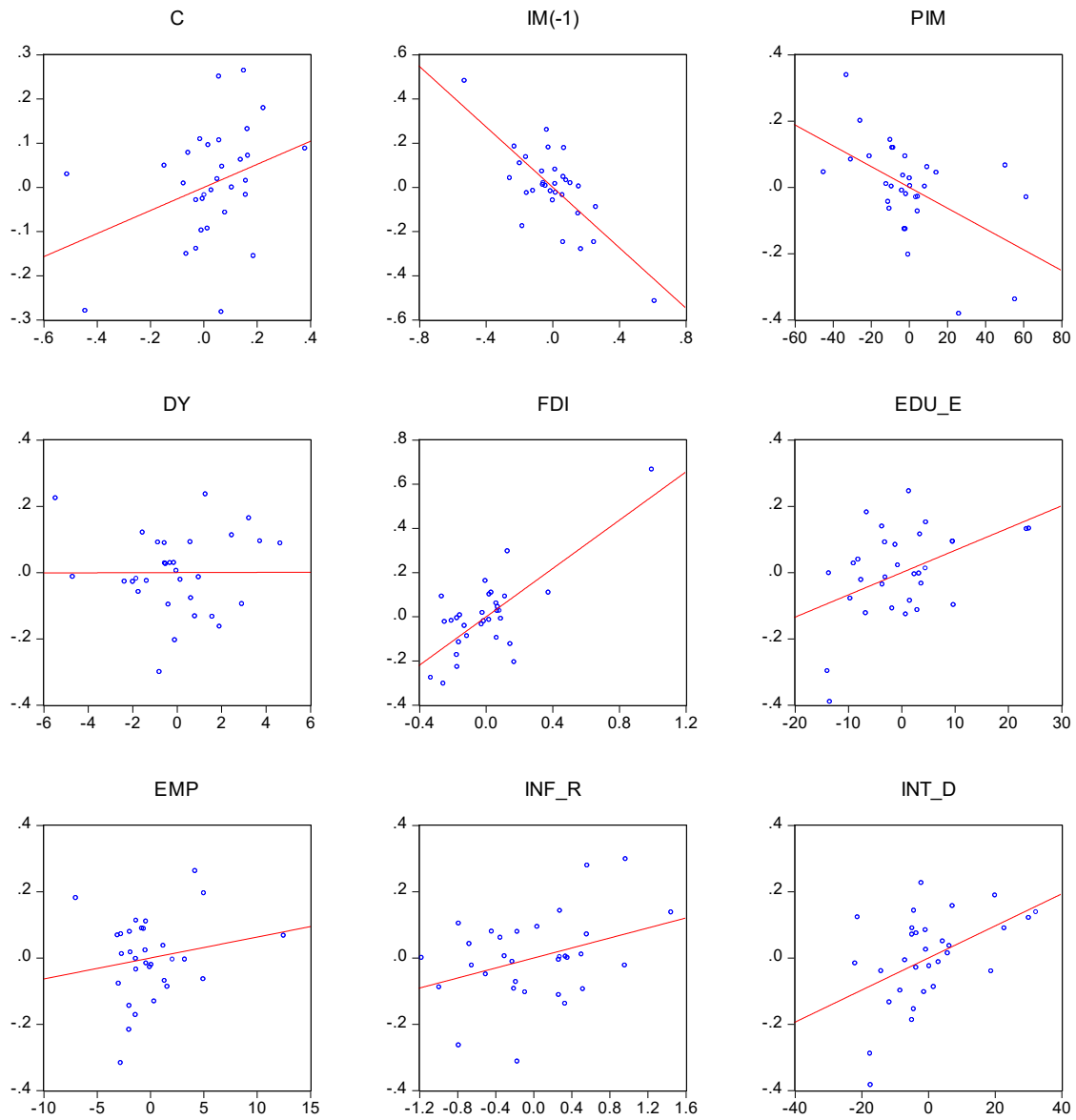


B.2.2 Services Imports

Influence Statistics



IM vs Variables (Partialled on Regressors)



B.3 Multicollinearity

B.3.1 Correlation Matrix (Services Exports)

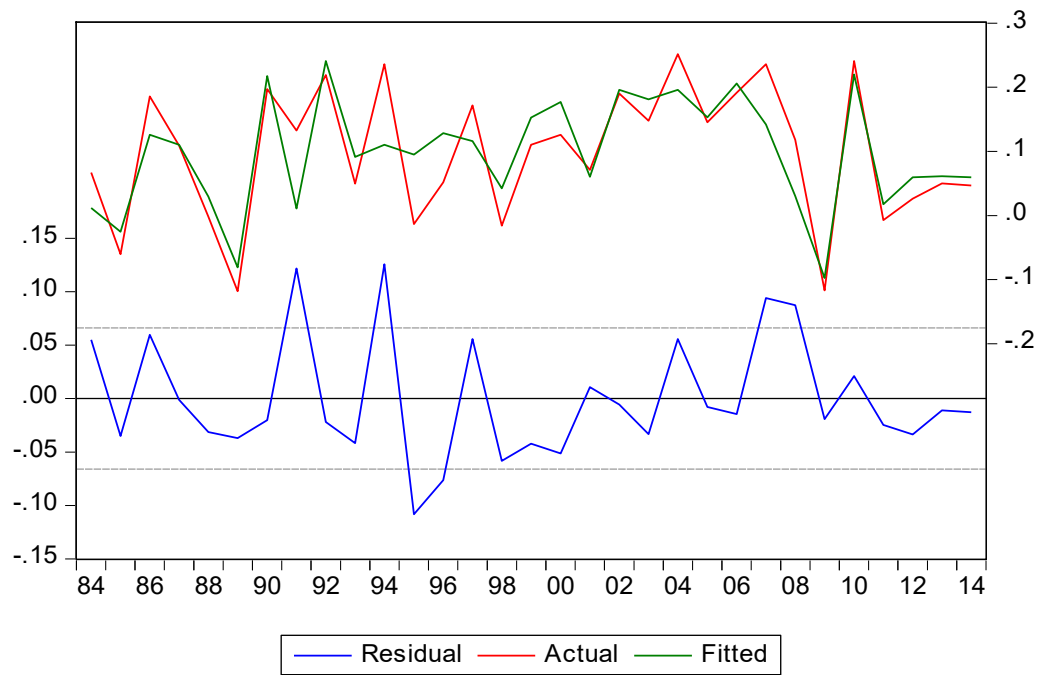
	EX(-1)	PEX	WY	FDI	EDU_G	EMP	INF_R	INT_D
EX(-1)	1.000000	-0.360943	-0.220080	0.158508	0.328250	-0.301567	0.027656	-0.070796
PEX	-0.360943	1.000000	0.244048	0.072859	-0.354333	0.400876	0.066268	0.041265
WY	-0.220080	0.244048	1.000000	-0.147204	0.154012	0.160971	0.287787	-0.284545
FDI	0.158508	0.072859	-0.147204	1.000000	-0.383613	0.226087	0.233640	-0.237541
EDU_G	0.328250	-0.354333	0.154012	-0.383613	1.000000	-0.217428	-0.029213	-0.118560
EMP	-0.301567	0.400876	0.160971	0.226087	-0.217428	1.000000	0.193975	-0.249947
INF_R	0.027656	0.066268	0.287787	0.233640	-0.029213	0.193975	1.000000	-0.132350
INT_D	-0.070796	0.041265	-0.284545	-0.237541	-0.118560	-0.249947	-0.132350	1.000000

B.3.2 Correlation Matrix (Services Imports)

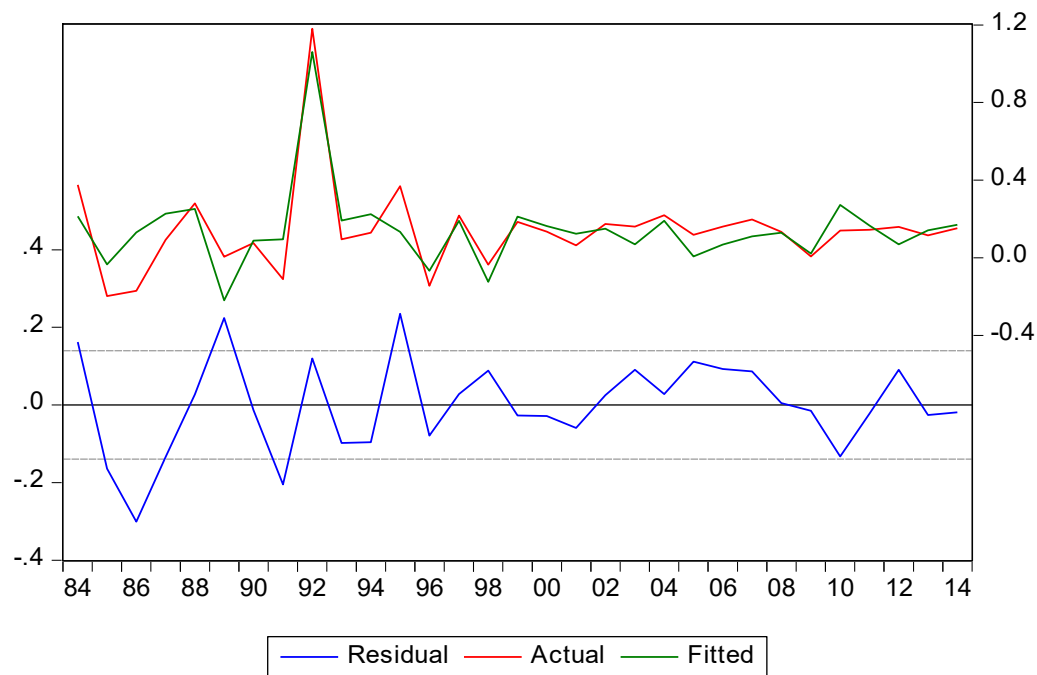
	IM(-1)	PIM	DY	FDI	EDU_E	EMP	INF_R	INT_D
IM(-1)	1.000000	-0.086206	0.153121	0.355991	0.168345	-0.013111	0.327573	-0.013729
PIM	-0.086206	1.000000	0.095328	0.072859	0.060325	0.400876	0.066268	0.041265
DY	0.153121	0.095328	1.000000	0.544671	0.249045	0.151191	0.217443	-0.212500
FDI	0.355991	0.072859	0.544671	1.000000	0.269333	0.226087	0.233640	-0.237541
EDU_E	0.168345	0.060325	0.249045	0.269333	1.000000	-0.011397	-0.403625	-0.296051
EMP	-0.013111	0.400876	0.151191	0.226087	-0.011397	1.000000	0.193975	-0.249947
INF_R	0.327573	0.066268	0.217443	0.233640	-0.403625	0.193975	1.000000	-0.132350
INT_D	-0.013729	0.041265	-0.212500	-0.237541	-0.296051	-0.249947	-0.132350	1.000000

B.4 Linearity

B.4.1 Services Exports

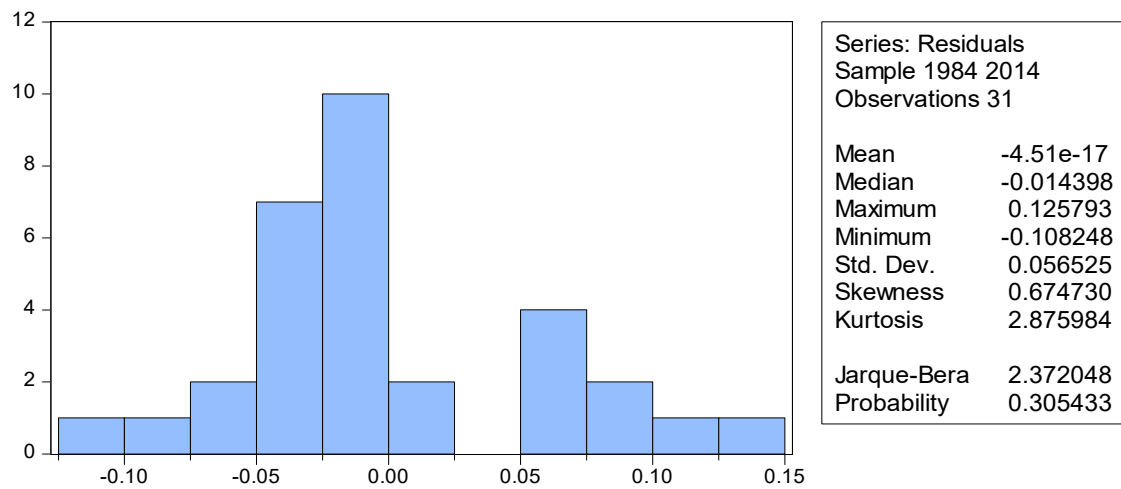


B.4.2 Services Imports

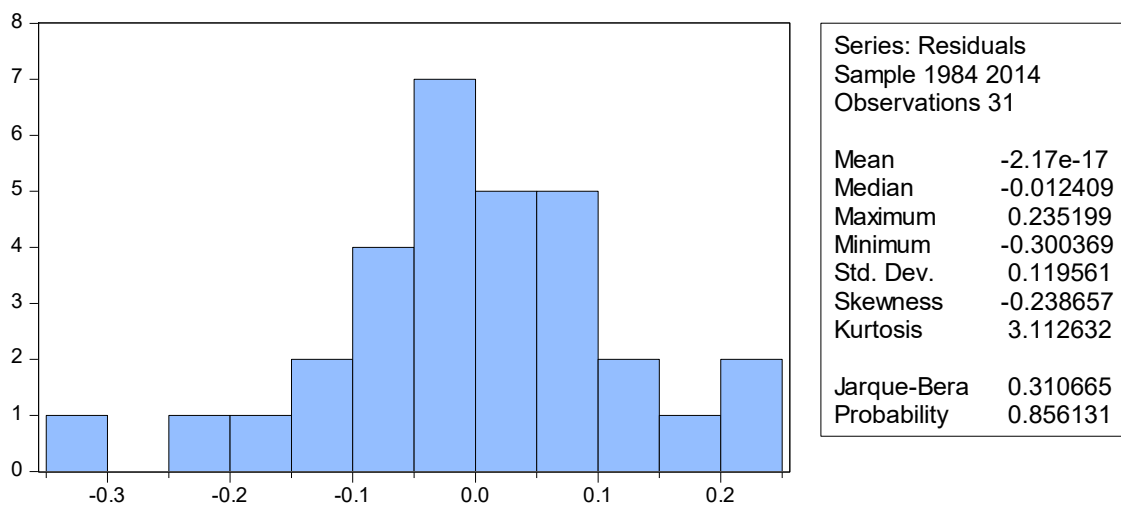


B.5 Error Term Normality

B.5.1 Services Exports



B.5.2 Services Imports



B.6 Error Term Homoscedasticity

B.6.1 Services Exports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.636872	Prob. F(8,22)	0.1712
Obs*R-squared	11.56702	Prob. Chi-Square(8)	0.1716
Scaled explained SS	5.464400	Prob. Chi-Square(8)	0.7070

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 02/03/16 Time: 22:20

Sample: 1984 2014

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009149	0.003958	2.311393	0.0306
EX(-1)	0.011313	0.008456	1.337836	0.1946
PEX	-5.61E-05	3.35E-05	-1.673873	0.1083
WY	-0.000353	0.000677	-0.521026	0.6076
FDI	-0.005883	0.002899	-2.029267	0.0547
EDU_G	-0.000116	7.31E-05	-1.592253	0.1256
EMP	0.000212	0.000216	0.984940	0.3354
INF_R	0.001635	0.000952	1.718117	0.0998
INT_D	-8.27E-05	5.30E-05	-1.559093	0.1332

R-squared	0.373130	Mean dependent var	0.003092
Adjusted R-squared	0.145177	S.D. dependent var	0.004305
S.E. of regression	0.003980	Akaike info criterion	-7.977222
Sum squared resid	0.000349	Schwarz criterion	-7.560903
Log likelihood	132.6469	Hannan-Quinn criter.	-7.841512
F-statistic	1.636872	Durbin-Watson stat	1.941855
Prob(F-statistic)	0.171240		

B.6.2 Services Imports

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.364738	Prob. F(8,22)	0.0526
Obs*R-squared	14.33248	Prob. Chi-Square(8)	0.0735
Scaled explained SS	7.624954	Prob. Chi-Square(8)	0.4709

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 02/03/16 Time: 22:21

Sample: 1984 2014

Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002852	0.018333	0.155561	0.8778
IM(-1)	-0.009496	0.016217	-0.585600	0.5641
PIM	0.000308	0.000137	2.254841	0.0344
DY	-8.29E-05	0.001451	-0.057132	0.9550
FDI	0.006454	0.013153	0.490671	0.6285
EDU_E	-0.000797	0.000351	-2.273417	0.0331
EMP	-0.001160	0.000925	-1.254375	0.2229
INF_R	0.001958	0.005258	0.372274	0.7133
INT_D	-0.000643	0.000236	-2.731417	0.0122
R-squared	0.462338	Mean dependent var		0.013834
Adjusted R-squared	0.266825	S.D. dependent var		0.020439
S.E. of regression	0.017501	Akaike info criterion		-5.015366
Sum squared resid	0.006739	Schwarz criterion		-4.599047
Log likelihood	86.73817	Hannan-Quinn criter.		-4.879656
F-statistic	2.364738	Durbin-Watson stat		2.075994
Prob(F-statistic)	0.052598			

B.7 Ramsey RESET Test

B.7.1 Ramsey RESET Test for Services Exports

Ramsey RESET Test

Equation: Services Exports

Specification: EX C EX(-1) PEX WY FDI EDU_G EMP INF_R INT_D

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.679699	21	0.5041
F-statistic	0.461991	(1, 21)	0.5041
Likelihood ratio	0.674594	1	0.4115

F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	0.002063	1	0.002063
Restricted SSR	0.095853	22	0.004357
Unrestricted SSR	0.093789	21	0.004466

LR test summary:		
	Value	df
Restricted LogL	45.58633	22
Unrestricted LogL	45.92363	21

B.7.2 Ramsey RESET Test for Services Imports

Equation: **Services Imports**

Specification: IM C IM(-1) PIM DY FDI EDU_E EMP INF_R INT_D

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	2.306391	21	0.0314
F-statistic	5.319441	(1, 21)	0.0314
Likelihood ratio	6.999348	1	0.0082

F-test summary:			
	Sum of Sq.	df	Mean Squares
Test SSR	0.086674	1	0.086674
Restricted SSR	0.428844	22	0.019493
Unrestricted SSR	0.342170	21	0.016294
Unrestricted SSR	0.342170	21	0.016294

LR test summary:		
	Value	df
Restricted LogL	22.36296	22
Unrestricted LogL	25.86264	21

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